

# *The* **Iron Age**

A Chilton Publication

THE NATIONAL METALWORKING WEEKLY • MAY 12, 1955

Can you cut  
your paperwork  
costs?  
First of a series  
See page 103



**NEW**

**DEPARTURES OF TOMORROW**



Versatile, easy-to-operate machines that take the backsache out of "ironing day" are a housewife's dream come true. And manufacturer after manufacturer has called on New Departure for its ball bearings.

It could well be that in less than a decade a compact new appliance for the home will clean and press a suit, coat or dress in seconds.

Of course, such a machine is yet to be developed. But one solid fact: when the "Valet-mat" does arrive, New Departure will be ready with the ball bearings to keep it operating smoothly and efficiently.

Today, practically any type of home-service product you can name is New Departure-equipped. So, when your thoughts turn to new departures of tomorrow . . . think of New Departure—the company that makes the great forward strides in ball bearing design and manufacturing.

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DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

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THE SAXON SMITH**

*Familiar to every Englishman of King Arthur's day was Wayland the Smith... maker of a mighty sword for Merlin the Magician. The legendary metalsmith escaped from Norway by forging himself a pair of wings. Soaring to freedom, he set up his forge in the Berkshire hills. If anyone had a tool to be mended or a horse to be shod, he left it with sixpence of Wayland's coin, and the versatile smith accommodated him promptly.*



*Crafts and craftsmen through the ages*

NUMBER FOUR OF A SERIES

Basic Refractories not only furnishes its customers with the finest refractories available, but also employs skilled craftsmen — men with practical steelmaking experience — to insure that the use of these products gives full value.

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**GRANULAR BASIC**



**REFRACTORIES**



## The Effect of Nickel in Alloy Steels

---

Each element in an alloy steel has its own particular job to do, and each is included with a special purpose in mind. What are some of the reasons, say, for using nickel, chromium, molybdenum, vanadium, and other components that appear in the various analyses? The elements in any alloy steel work both individually and as a team. What does each one do? In this and subsequent discussions we shall try to answer these questions, beginning with nickel, one of the fundamental alloying elements.

Nickel increases toughness and resistance to impact, particularly at low temperatures; lessens distortion in quenching; improves corrosion-resistance. It lowers the critical temperatures of steel and widens the temperature range for successful heat-treatment.

Nickel steels are particularly suitable for case-hardened parts, such as aircraft-engine gears and roller bearings. Such steels provide strong, tough, wear-resistant cases and also ductile core properties.

Advantages imparted by nickel are not restricted to quenched-and-tempered steels. Nickel often permits given strength levels to be obtained at considerably lower carbon contents, thereby markedly in-

creasing toughness, plasticity, and fatigue-resistance. Nickel steels are therefore highly suitable for applications where liquid quenching is not employed, such as high-strength structural steels used in the as-rolled condition or heavy forgings not adapted to quenching. Products of this nature must develop superior properties after nothing more severe than air-quenching treatments.

If you would like to know more about nickel steels, or need information about other types of alloy steels, please feel free to consult with Bethlehem's metallurgists. These technicians will gladly advise you regarding analyses, heat-treating, machinability, etc. You are invited to make use of their services whenever you need assistance.

And may we remind you, too, that Bethlehem makes all AISI standard alloy steels, as well as special-analysis steels and the full range of carbon grades. We are always in a position to meet your needs promptly and fully.

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**BETHLEHEM STEEL**

Starred Items are digested at the right

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### NEWS DEVELOPMENTS

#### BOBBY PINS ADD UP TO BIG BUSINESS — P. 58

Each year American women use pins for their hair to the tune of 10,000 tons of steel. Spring type pins came in with bobbed hair. They call for special grades of steel wire and demand precision manufacturing.

#### EXECUTIVE TRAINING PROGRAMS GET RESULTS—P. 59

Under various names executive training programs are finding wide acceptance today and are beginning to pay off. Idea is that executives are made, not born. A recent survey showed a swing toward the management training idea and drew comments ranging from good to excellent on results.

#### COMMAND CHANGES AT U. S. STEEL CORP. — P. 60

Ben Fairless has been succeeded by Roger M. Blough as board chairman and chief executive officer of U. S. Steel. Move was in accordance with a corporation age rule. Mr. Fairless will continue as a member of the board of directors and head new committee.

#### A-BOMB GIVES CIVIL DEFENSE SHOT IN ARM — P. 62

Doom Town becomes Survival Town following test blast. Many residents would have survived. Telephone, gas and power systems remained surprisingly intact and operable. Some types of home construction stood up close to blast. Military in tanks and personnel carriers withstood blast close to ground zero.

#### AUTOMAKERS SAY DEMAND OUTRUNS SUPPLY— P. 72

In Detroit top officials are generally optimistic over prospects. Henry Ford, II, says his company can't keep up with demand. A Chrysler spokesman sounds an equally bright note. There is some pessimism but overall feeling is that record production is backed by solid demand and the market will hold.

#### U. S. PLANS MORE DEFENSE BUYING ABROAD — P. 77

Defense Dept. is planning to do more of its military procurement in foreign markets. Reasons given include lower costs and need to bolster allies' production. Defense Dept. officials expect protests but say overall picture dictates move.

#### MACHINE TOOL SHOW LOOMS LARGER — P. 83

Preparations for the Machine Tool Show at Chicago are moving ahead on schedule. Officials say the show will be a "three ring circus" of machine productivity. Machine savings, obsolescence hazards will be shown.

## IN METALWORKING

### ENGINEERING & PRODUCTION

#### PROPER HANDLING DEVICES AID PICKLING — P. 95

Batch pickling equipment must have high strength-to-weight ratios and superior resistance to acids. Well designed, corrosion resistant devices simplify work handling and increase payloads. Carriers have been developed for all common pickling operations. Many are ready-made while others are designed for unusual jobs.

#### TRANSFER DIE FORMS IMPELLERS FROM STRIP — P. 98

One way to stamp a torque converter part would require three dies, three presses and three operators. An automobile producer chose to use a three-station transfer die on a conventional press to achieve efficient, automatic production. A transfer device is built into the die and is actuated by the press ram. Each press stroke produces a finished part. The die draws, punches, forms and trims complex pieces from strip.

#### FURNACE TYPES DICTATE DUST CONTROLS — P. 100

Effective air pollution control for plants melting nonferrous metals depends on the metals processed and the furnaces used. In brass melting, yellow grades usually require more elaborate measures than red alloys. Lead smelters find baghouses most practical.

#### METHOD REPRODUCES PAPERS INEXPENSIVELY—P. 103

Communications in industry are getting more attention from management. This first article of a three-part series tells of an improved method of making paper plates for offset reproduction which saves Chrysler more than \$250,000 per year. It can be used for drawings, letters, reports, press releases and financial statements.

#### CHANGE SHARPENING PRACTICE ON CUTTERS—P. 107

Chip crowding is often the culprit when gear shaper cutters wear too fast, cause gear errors and poor finish. With helical cutters, changing the helical rake and face angles brings better chip flow control.

### MARKETS & PRICES

#### WHY SCRAP IS DOWN WHEN STEEL IS UP — P. 55

There's a seeming paradox in the scrap market. Prices have dropped \$1 to \$4 in the past month despite the fact that steel production is hovering near capacity levels. Here's why: auto industry is turning out huge amounts of scrap; mills have good inventories of both scrap and ore; are using more hot metal in open-hearths. Also stress on flat-rolled products for auto industry automatically means greater scrap output.

#### DO-IT-YOURSELF CREATES MAJOR MARKET — P. 64

Popularity of do-it-yourself move is seen in the \$7 billion yearly showing of the industry. Increased leisure time and high cost of services are major factors in spectacular growth. And an increasing number of products designed for home construction have come on the market. Power tool makers are getting a big play from home builders.

#### FOURTH QUARTER STEEL DEMAND SHAPING UP—P. 151

Steel consumers are beginning to worry about fourth quarter supplies. Some flat rolled business has been placed for October and November. Feeling is that even an automotive slowdown will not ease tight supply of sheets and strip. Producers report there is little evidence of inventory-building. Indications are that auto makers will postpone bringing out of new models. Mills are now convinced that there will be no summer easing. Consumers plan to receive during vacations.

#### GALVANIZED SHEETS STEADILY TIGHTENING — P. 152

Hard-pressed producers of galvanized sheets are seeing even tighter days ahead. In important producing areas, galvanized is all but sold out for the rest of this year. Unofficial estimates are that shipments this year will total 2½ million tons. Estimates for 1960 range around 3 million tons.

### NEXT WEEK:

#### HOW USERS GAIN FROM CAST PEARLITIC ALLOYS

Efforts to cut raw material and manufacturing costs have shifted much attention to pearlitic malleable castings. Many firms find that the mechanical properties of these cost-saving alloys are better than those of materials used formerly. They cover a wide range of strength and hardness values, have good machinability.

#### WHAT DOES STEEL LABOR HAVE UP ITS SLEEVE?

Current USW meeting poses the question of what steel labor has planned for the future. This year's negotiations are confined to wage talk but what about after that? Next week's Special Report discusses the subject of shorter hours, guaranteed wage and other vital points as they apply to the steel industry.

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of metal turnings handling  
with this Jeffrey  
**Crusher-Conveyor Team**

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- LOWER HANDLING AND STORAGE COSTS
- GET A BETTER MARKET PRICE
- SHIP MORE TONNAGE PER CAR




Metal turnings being magnet-loaded onto Jeffrey Apron Feeder Conveyor in tandem with Jeffrey Crusher. Note Jeffrey Steel Apron Conveyor (left) taking crushed turnings into plant for making briquettes.

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Write for Bulletin 828.



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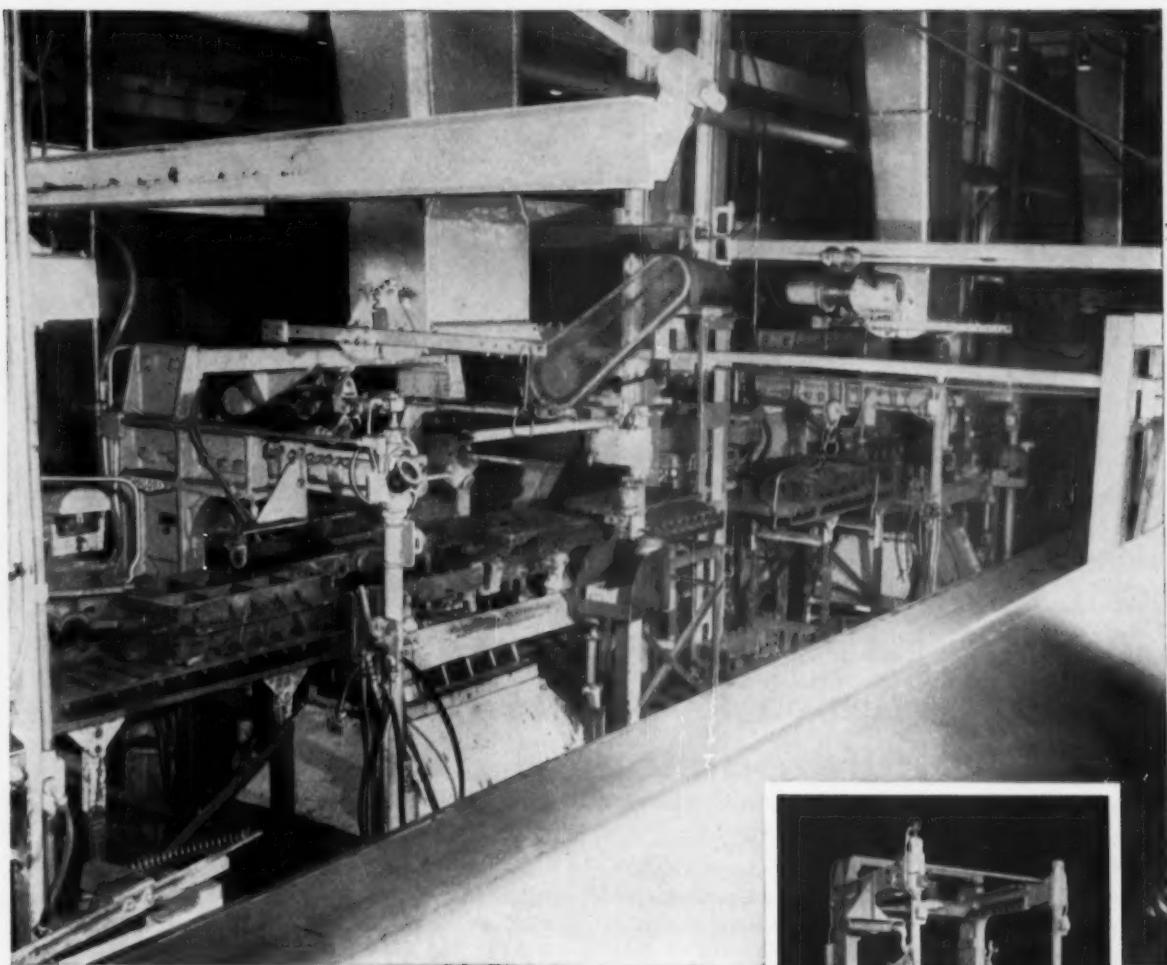
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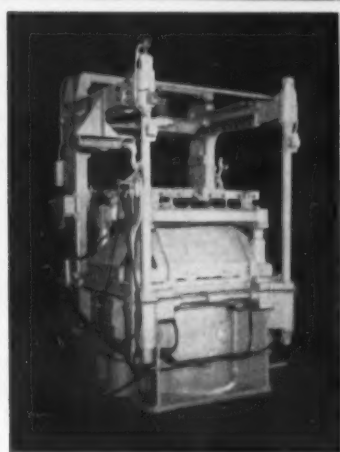
## Line-up for low-cost castings

**MODERN FOUNDRY MEETS HIGH PRODUCTION  
NEEDS WITH OSBORN MOLDING MACHINES**

**T**HIS line of Osborn Jolt Squeeze Strippers mechanically handles all the operations of turning out molds for engine blocks. A high rate of production is maintained at low cost per mold.

Based on 30 years' experience with Osborn Molding Machines, this automotive manufacturer again chose Osborn equipment for his new, modern foundry. The No. 1236 Osborn automatic machines, engineered for his molding needs, not only meet the high production requirements, but produce molds that are accurate in size, uniform in density.

Have an Osborn specialist show you how to cut costs by modernizing your foundry with new Osborn developments in making sand molds. Write *The Osborn Manufacturing Company, Dept. FF-31, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

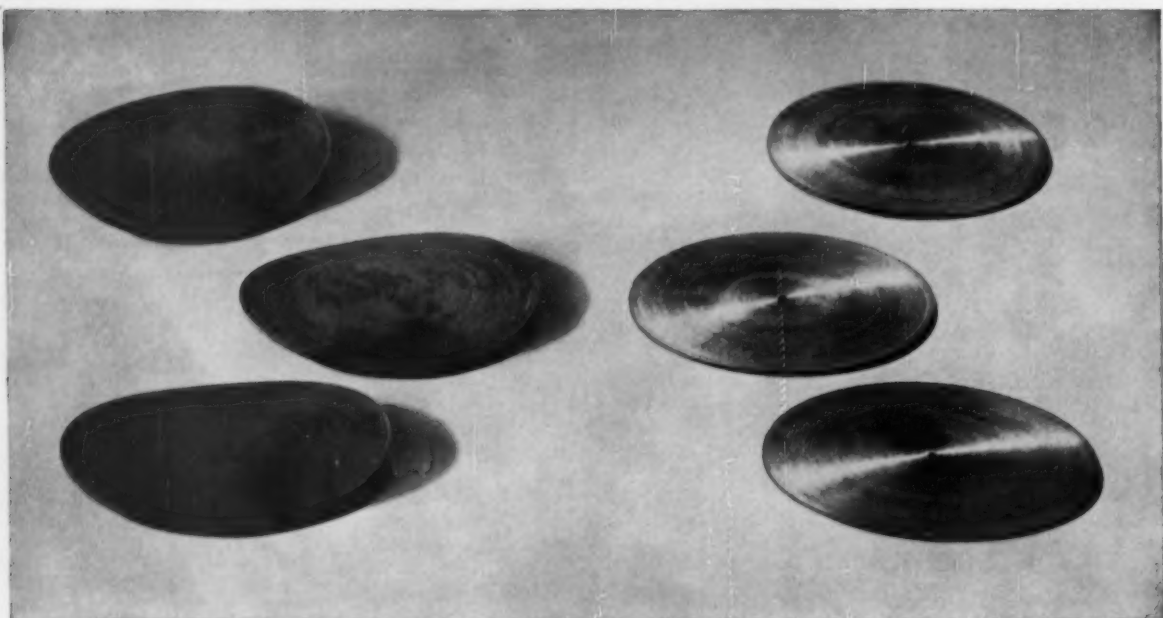


**OSBORN**

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Another example of Osborn leadership and advanced engineering

May 12, 1955



## Why Armco 17-4 PH Stainless Steel cures distortion problems

Here's how Armco 17-4 PH Stainless Steel and standard hardenable stainless steel reacted to heat treatment. The three samples at left are all Type 431 stainless steel; the ones at the right are Armco 17-4 PH. Both sets of discs are of the same dimensions, cut from 1 1/4" diameter bar stock. All have been heat treated to Rockwell C-40 to C-41.

### LOW TEMPERATURE DOES IT

The Armco 17-4 PH samples have only a brown heat-tint discoloration—are perfectly flat, typical of what you may expect in your own plant. The reason is that Armco 17-4 PH is a precipitation-hardening stainless steel. The parts were fully hardened by merely holding at 900 F for 1 hour and air-cooling.

On the other hand, the Type 431 samples had to be heated to 1900 F, quenched, then stress-relieved at 600 F. They are scaled and distorted.

### 2 PRECIPITATION-HARDENING TYPES

If you are confronted with distortion and scaling in hardening stainless steels, Armco 17-4 PH may solve your

problem. It is made in billets, bars and wire only.

For unusually high mechanical properties in sheets, strip, plates, and wire, there is a companion grade, Armco 17-7 PH. This grade takes either single or double precipitation-hardening treatment, depending on form and condition.

### SEND FOR INFORMATION

For complete information on the Armco Precipitation-Hardening Stainless Steels, just fill out the coupon and mail it to us.

#### ARMCO STEEL CORPORATION

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Send me information on your precipitation-hardening stainless steels, Armco 17-4 PH and Armco 17-7 PH.

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and the Engineering Index.



## Editorial:

### Let's Tell The Real Story

♦ LET'S START OUT with the premise that we need friends in Asia. Let's admit too that when we help Far Eastern countries, we are helping ourselves as well as them to fight Communism.

But we keep our light under a bushel. There is—or appears to be—confusion as to what our aim in life is. The Asians get motion picture and tourist viewpoints of our fringe living.

The Communists are robots when it comes to the values of life. But they talk the gospel of the brotherhood of man. We believe in man's dignity, but prate about our mechanistic advances.

This race between the free world and the slave world will be decided by more than guns. There must be more than butter, too. One of the places where we need to emphasize the spiritual and human approach is in Asia—if we are to weld a bulwark against the Communists.

We have all the things that Asiatic people believe in. They don't know it because we are self-conscious about things concerning the heart. Our actions are from the heart, but our talk often sounds like the latest description of a 1975 atomic home washer.

Do people in Asia know how many millions of everyday Americans go to night school to take up painting, child raising, plumbing, cooking, writing, philosophy, religion, and a host of other things that help to make life worthwhile?

Do our foreign friends know that millions upon millions of Americans sit down each night to a family meal where everything is talked over with everyone getting a chance to speak his piece? Our news covers the unusual, not the normal behavior of Americans.

Do we tell our friends that Parent-Teacher's Associations are reaching their peak in action, thought and plans? Or that American parents do try to do a good job with their kids; that they do play with them, guide them and love them?

Is there any mention of bird watchers, nature lovers, picture takers, neighborhood helpers, hospital workers, or people who love children enough to want to adopt them?

Some highbrow people might think an airing of all this would be corn. But corn is one of America's biggest products. Let's have more of it.

*Tom Campbell*

EDITOR



BUILDS EXTRA SELLING POWER INTO YOUR PRODUCTS



## THEY buy A. W. STRIP Steel, too! (Hot and cold rolled)

'They' are the people who buy products made with ALAN WOOD strip steel. 'They' are housewives, children, manufacturers—you and I.

Perhaps they can't always see the superior qualities derived through precise, metallurgical control and "custom-production" of strip steel—but they *do* know these qualities must be present—because of the product's strength, dependability and reputation.

If you require strip steel, your

products deserve the "custom-produced" qualities of superior strip . . . for minimum waste . . . less wear and tear on tools . . . easier, faster production. They deserve ALAN WOOD strip steel.

For products requiring hot or cold rolled strip or sheets, call upon the services of a versatile, integrated steel specialist with modern, up-to-date, continuous mills—where steel is produced to your specific requirements—ALAN WOOD STEEL COMPANY.

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dear editor:

### "Steel Outlook"

Sir:

We find your weekly steel production estimates by district in "Steel Outlook" of great value to us. In fact, we have set up fairly elaborate forms to tabulate these rates to convert them to quarterly figures as a guide to our sales department.

It has occurred to me that many others must do this same thing. I'm sure you could perform a real service by publishing current quarterly figures along with your "this week," "last week," "month ago," "year ago" figures. *L. R. Burnett, Sales Service Dept., Kaiser Aluminum & Chemical Sales, Inc., Chemical Div., Oakland, Calif.*

We don't report quarterly figures because The American Iron & Steel Institute tabulates this material very promptly and publishes it on its Form 102.—Ed.

### New Cars

Sir:

As you may already know, many automobile dealers are loaded with so many new cars that in many cases short cuts are taken in preparing a new car for delivery. Result is a source of aggravation to the owner who has just laid out a considerable bundle of cash and naturally expects to get somewhere near his money's worth. From my own experience and that of other car owners whom I know, the harsh fact comes out that many car dealers are out just for the fast buck . . .

Service during the guarantee period is often superficial and only as little as the dealer thinks he can get away with. And so far no one has started a campaign to take the part of the unorganized car owner.

How about getting some opinions from IRON AGE readers who I am sure have had some of these costly and exasperating experiences with

### letters from readers

a new car? Much good would come from some mention of the situation if for no other reason than to get car owners to put up more of a holler to the car makers. *R. Blagden, East Hampton, Conn.*

### Good Gears

Sir:

The article "Good Gears Are No Accident" which appeared in your March 10, 1955 issue was most interesting and informative.

If any reprints of this article are available for distribution, I would appreciate receiving 6 copies for our library. *N. O. Kates, Lindberg Steel Treating Co., Melrose Park, Ill.*

### Blast Cupola

Sir:

Would you please be kind enough to send us three tear sheets of the article in your April 21 issue entitled "Metallurgical Blast Cupola Offers Improved Melting Efficiency," by S. T. Jaswinski. *W. M. Akin, President, Laclede Steel Co., St. Louis.*

Sir:

We are wondering if it would be possible to obtain about 10 additional copies of the article "Metallurgical Blast Cupola . . ." which appeared on pp. 87-91 of your April 21 issue. *H. S. Chillas, Asst. Advertising Manager, Whiting Corp., Harvey, Ill.*

### Modern Hydraulics

Sir:

WOULD LIKE IF POSSIBLE 10 COPIES OF ARTICLE "MODERN HYDRAULIC SYSTEMS . . ." PP. 110-114 FROM MARCH 17 ISSUE. *W. C. Bennett, Advertising Dept., Vickers, Inc., Detroit.*

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Reamers  
have a  
Wider Range  
of  
Standard  
Sizes*

LAVALLEE & IDE, INC.

*Large Sizes*

TO 1½"

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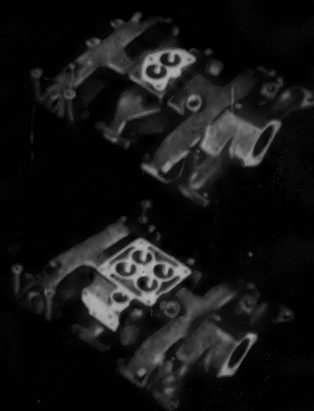
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*Another Transfer-matic by Cross*

**Mills, Drills,  
Bores, Taps,  
2 and 4 Barrel  
Intake Manifolds**



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- ★ 140 pieces per hour at 100% efficiency.
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- ★ Push-button changeover from 2 to 4 barrel carburetor.
- ★ 13 stations; 1 loading, 11 working, 1 unloading.
- ★ Lift-and-carry type transfer mechanism.
- ★ Pre-set tooling throughout.
- ★ Other features: construction to J.I.C. standards; complete interchangeability of all standard and special parts for easy maintenance; hardened and ground ways; drag chain type chip conveyor.



Established 1898

THE **CROSS** CO.  
DETROIT 7, MICHIGAN  
*Special* MACHINE TOOLS

## fatigue cracks

### Return of the Yucca Kid

Editor Tom Campbell has been covering the A-Bomb Business in Nevada. Last week's issue carried his formal report on the frustrating delays. Here is Tom's informal report, same subject.

Flamingo Hotel  
Las Vegas, Nevada

Dear Mister Coffey:

This is Friday, April 29th and the bomb hasn't gone off yet. Ner will it go off tomorrow and it probably won't go off Sunday and I think it might not go off for another week. (It finally went off on May 5.—Ed.)

But we do have a better idea of Operation Letdown, as opposed to the official name of Operation Cue. Apparently most people have not been cued in. Set it? (Yes, sir.—Ed.) But then a lot of people who lost 3 days' sleep and on two occasions shivered and shook at News Nob 7 miles from ground zero know now that when AEC and FCDA persons say to wear gloves, long underwear, paper vest or what have you in April here that is what they mean.

But it sure is interesting to see how different people took the postponements upon postponements. The hotels had a heckuva time because they had rooms sold to other people after the bomb went off—so they thought—last Tuesday.

First, there was the guy who thought they did it to him personally. But I don't think they did because a 40 kiliton bomb (equal to 40,000 tons of TNT) is no laughing or easy matter to dispose of. Anyway that fellow got religion after the third or fourth cancellation.

The members of press, radio, and television had themselves a ball—ice-ball that is. One fellow on the second night (2½ hours on the bus one way from Las Vegas to the News Nob) had to rub his hands with antifreeze to get them to work on the typewriter, pounding out the story that wasn't there. Then the luckless radio and television men who had to make three set-ups or more only to have nothing to talk about except where was the coffee and what was the AEC doing to them—boy, they had it!

But then there were the top billings in the fourth estate who had been through this thing before and knew ahead of time that the \*#(X) thing would not go off. Then there were the news boys who have

by William M. Coffey

been assigned to the whole series out here in Yucca Flat and Frenchmen Flat who take life with a grain or a carload of sand. And speaking of sand, last Friday and Wednesday there was enough sand blowing around to blot out any 1/2000 of a second shots any big shot might have been taking at the Flamingo Hotel pool in case he did not go to bed or play the "games."

What with 1800 observers, including congressmen, governors, business people, civil defense people from all over and 450 newsmen, you can imagine that the AEC people wish that they had never made Operation Cue—operation miscue, to date—an open shot. Naturally, the rumors were that AEC was afraid of the public and the President, and that they were doing it out of meanness, they didn't know what they were doing, they had bum weather reports and that they had a secret dislike for people in general and this was the first time they could go on a sadistic jag or binge.

Our operative tells us, though, that none of these reasons were the real ones. The real reason was — and still is — that when you are fumbling around with a shot that has the blast of 40,000 tons of TNT and serious radiation fallout possibilities on towns and nearby people the AEC is going to be darned sure they set the bomb off at the right time — and when that right time comes you can bet all the factors that will be checked would make a so-called perfectionist look like a piker—or a Las Vegas gambler.

So long, mister Coffey—and I hope you don't get caught out in an 18 degree freeze the last of April without your long underwear like I did AT FIRST but not now, Bud.

Yours in complete and controlled frustration,

Tom Campbell, the Yucca Kid—that was.

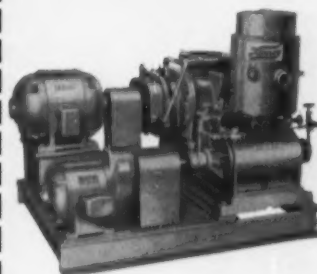
### New Puzzler

A certain walled city had 4 gates at each of the 4 main points of the compass. A man walked directly east out the east gate one mile. As he looked on a line tangent to the wall of the city he saw a man who was standing exactly one mile due south of the south gate. What is the diameter of the walled city?

Many thanks to Mr. R. D. Boyssel, Gary Steel Works, for this puzzler.

# VACUUMS

QUICKLY PRODUCED  
RELIABLY MAINTAINED

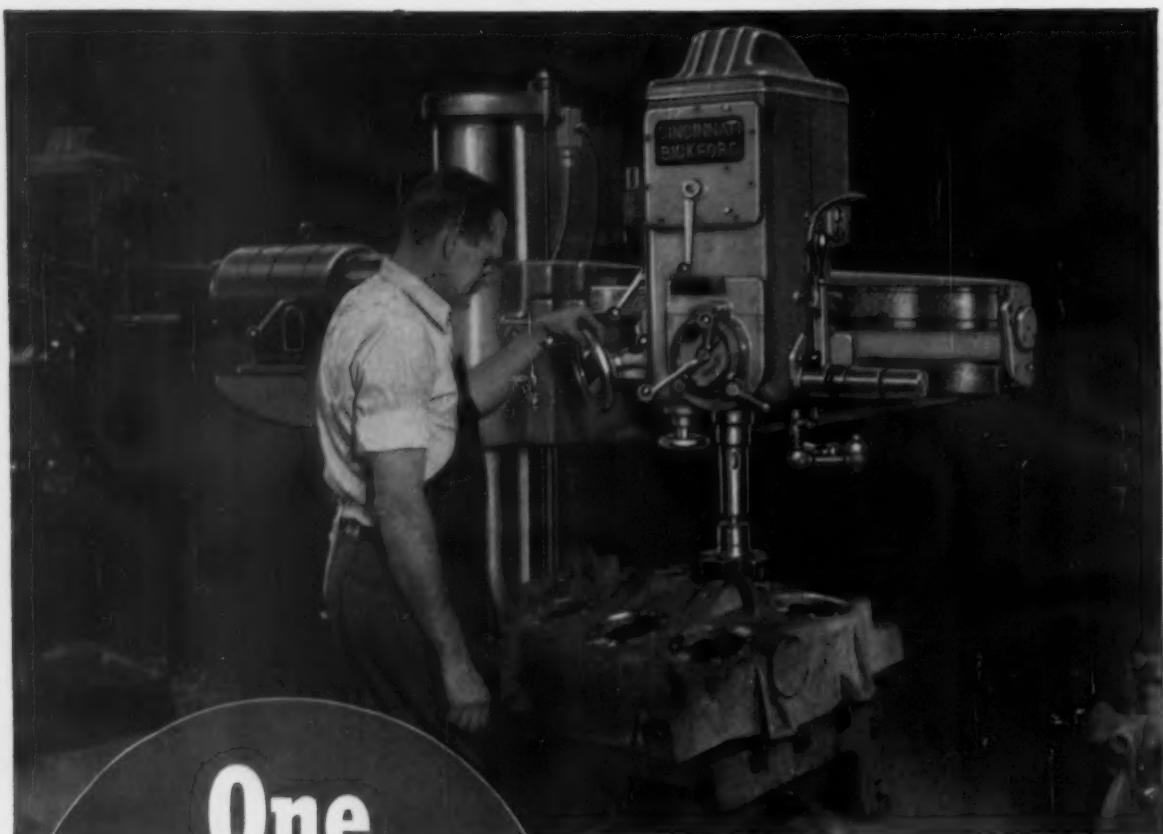


Model KMB 1200 — KDH 130

Kinney Vacuum Pumps are widely used in all phases of vacuum metallurgy to provide the fast pumpdown, rapid recovery, and long dependable service required for high speed production of gas-free ingots.

Kinney Vacuum Pumps range in size from the 2 cu. ft. per min. unit to the 780 cu. ft. per min. model. Send for Catalog 425 which provides information on the complete Kinney line, including the revolutionary new KMB two stage Mechanical Booster Pump. Write Kinney Manufacturing Division, The New York Air Brake Company, 3634 Washington Street, Boston 30, Mass. or consult the competent Vacuum specialists at our District Offices — in Boston, New York, Philadelphia, Cleveland, Chicago, and Los Angeles. Inventory and shop facilities are available at Los Angeles.

## Kinney



**One  
set-up saves  
30%**

*Photos courtesy of the Kelman Electric & Mfg. Company, Los Angeles, California.*

Boring, facing, and high speed drilling with one set-up cut the floor to floor time about one-third on this job.

The Kelman Electric & Mfg. Company say their Cincinnati Super Service Radial Drill "handles easily, is very accurate and versatile."

They are facing 6" diameters; drilling for  $\frac{1}{2}$ " bottom tap, and tapping with a  $\frac{1}{2}$ " bottom tap on this job.

The part being processed is a Bronze Top Casting.

Cincinnati Super Service Radial Drills are profit makers in this shop, and they could be in yours.

*Write for Bulletin R-21C*

**CINCINNATI  
BICKFORD**



RADIAL AND UPRIGHT DRILLING MACHINES

**THE CINCINNATI BICKFORD TOOL CO.**

Cincinnati 9, Ohio, U.S.A.



## dates to remember

### MAY

**NATIONAL ASSN. OF SHEET METAL DISTRIBUTORS**—Spring meeting, May 12-13, Cleveland Hotel, Cleveland. Association headquarters are at 1909 Arch St., Philadelphia.

**SOCIETY FOR APPLIED SPECTROSCOPY**—Annual meeting, May 12-13, Hotel New Yorker, New York City.

**AMERICAN INSTITUTE OF INDUSTRIAL ENGINEERS, INC.**—Annual conference and convention, May 12-14, Kingsway Hotel, St. Louis.

### EXPOSITIONS

**NATIONAL MATERIALS HANDLING EXPOSITION**—May 16-20, International Amphitheatre, Chicago. Management: Clapp & Pollak, Inc., 341 Madison Ave., New York.

**NATIONAL ASSN. OF PURCHASING AGENTS**—Annual convention and Inform-A-Show, May 29-June 1, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Place, New York.

**BASIC MATERIALS EXPOSITION**—May 31-June 3, Convention Hall, Philadelphia. Show management: Clapp & Pollak, Inc., 341 Madison Ave., New York.

**AMERICAN WELDING SOCIETY**—Annual Symposium, Manger Hotel, Cleveland, May 13th.

**NATIONAL FEDERATION OF INDEPENDENT SCRAP YARD DEALERS, INC.**—Open Forum and Dinner at the Waldorf-Astoria Hotel in New York on May 15th. Federation headquarters are at 29 Broadway, New York.

**INDUSTRIAL HEATING EQUIPMENT ASSN., INC.**—Spring meeting, May 15-18, The Homestead, Hot Springs, Va. Association headquarters are at 412 Fifth St., N. W. Washington, D. C.

**PORCELAIN ENAMEL INSTITUTE**—Mid-Year Division conference, May 18-20, Edgewater Beach Hotel, Chicago. Institute headquarters are at Dupont Circle Bldg., 1346 Connecticut Ave., N. W. Washington, D. C.

**AMERICAN STEEL WAREHOUSE ASSOCIATION, INC.**—46th Annual meeting, The Statler Hotel, Boston, Mass., May 22nd. Association headquarters are at 442 Terminal Tower, Cleveland, Ohio.

**AMERICAN MANAGEMENT ASSN.**—Conference, May 23-25, Hotel Roosevelt, New York City. Association headquarters are at 330 W. 42nd St., New York.

**MACHINERY DEALERS NATIONAL ASSN.**—Convention, May 23-25, Netherland Plaza Hotel, Cincinnati. Association headquarters are at 1346 Connecticut Ave., N. W. Washington, D. C.

**AMERICAN FOUNDRYMEN'S SOCIETY**—Annual convention, May 23-27, Houston. Society headquarters are at Golf & Wold Rds., Des Plaines, Illinois.

when competition crowds you



## give yourself dollar room

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Many businessmen are now feeling a pressure of competition that could be eased, in a few days, by more cash for current operations.

With cash you can do business more efficiently and economically. You can buy to better advantage, take trade discounts, extend broader credits to your trade, buy more efficient equipment, cut your internal operating costs.

In many cases, the dollars exist in your business in the form of receivables, inventory, or other assets which can be turned into immediate cash by a Walter E. Heller & Company plan of commercial financing fitted to your special needs.

Throughout America, companies of various sizes in many different lines of industry are now using Heller funds and Heller plans at the rate of

more than \$600,000,000 annually. Management and profits are not affected by Walter E. Heller & Company financial arrangements, which are purely a financial service. This service is available to companies which qualify, for any required period . . . months or years, in amounts as little as \$25,000 or more than \$3,000,000. Banks know and recommend Heller service as a supplement to normal bank financing.

If competition now has you in a corner, it will pay you to write immediately for a free copy of "Operating Dollars for Every Business" which will give you a general picture, with case histories, of Heller operations. Write today. If you have a financial problem to which our service might apply, tell us about it in confidence or invite us to telephone.



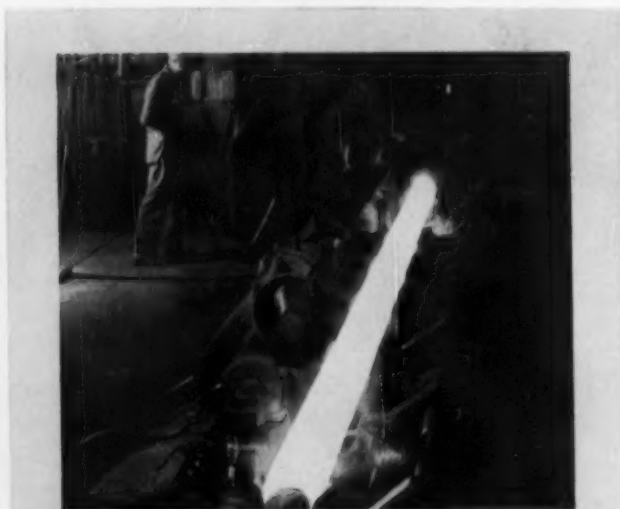
## Walter E. Heller & Company

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105 WEST ADAMS STREET, CHICAGO 90  
10 E. 40th ST., NEW YORK, NEW YORK

# BACKBONE OF A NATIONAL



**NATIONAL SEAMLESS TUBULAR STEEL PILES** provide low cost for higher loads. Not only by shape and steel strength are pipe piles outstanding, they also provide a hollow form for filling with concrete. The sum of these qualities gives National Seamless Pipe Piles low cost for high bearing capacity.



**THE NATIONAL SEAMLESS METHOD** of manufacture is one of the most difficult forging operations in the steel industry. A billet of the finest steel is actually pierced to produce a seamless tube with absolutely uniform wall strength. No welds . . . no joints . . . no weaknesses.

**THE TOUGH SWEENEY POWERENCH** has geared action for tightening or loosening nuts on dual wheels, aircraft propeller shafts, diesel engine cylinder heads, etc. The strength, uniformity, and dimensional accuracy of Seamless Tubing make it ideal for the manufacture of these rugged tools.

**NATIONAL SEAMLESS PIPE AND TUBES** are available in 25 different steel analyses—each designed to combat specific refinery problems such as oxidation, exposure, temperature, etc. Other chemical compositions are also available in tubular products, and a wide variety of high temperature problems are now under study.



# HUNDRED INDUSTRIES...

# Seamless Pipe and Tubes

Whether you are manufacturing heavy-duty lug wrenches or erecting vast refineries, you'll want pipe and tubes that possess great strength... insure long life and complete dependability. In short, you'll want USS NATIONAL Seamless Pipe and Tubes.

NATIONAL Seamless combines to the highest degree the desirable qualities of strength, safety and workability. Uniform throughout and dimensionally accurate, NATIONAL Seamless Pipe and Tubes ma-

chine cleanly, weld readily, and promise smooth installation and long satisfactory service. Available in a complete range of steel analyses, wall thicknesses and diameters, every foot of NATIONAL Seamless is produced to exacting standards by the world's largest manufacturer of tubular steel products.

Bring your pipe and tubing problems to National Tube. Regardless of the application, our engineers are interested in discussing the problem with you.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.



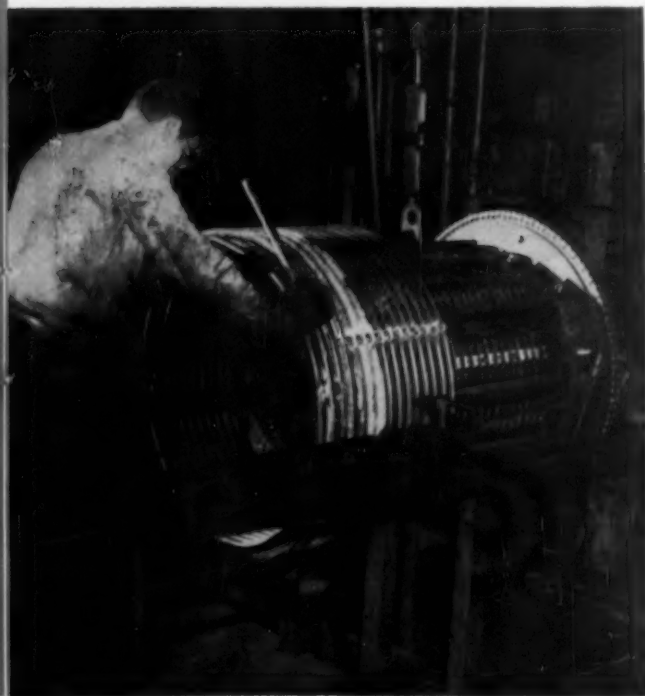
## National Seamless Pipe and Tubes



UNITED STATES STEEL

POWER UNITS AND HEAT TRANSFER EQUIPMENT call for thin-walled, smooth-surfaced tubes that offer the *least* resistance to the flow of heat, yet the maximum resistance to pressure. One material possesses the ideal combination of properties for this type of service—Seamless Steel Tubes.

MASTS AND BOOMS OF NATIONAL SEAMLESS are widely used by the shipbuilding industry because they are extremely strong and rigid, yet comparatively light—easy to raise and maneuver. Their swaged and shrunk joints prevent slipping or telescoping.





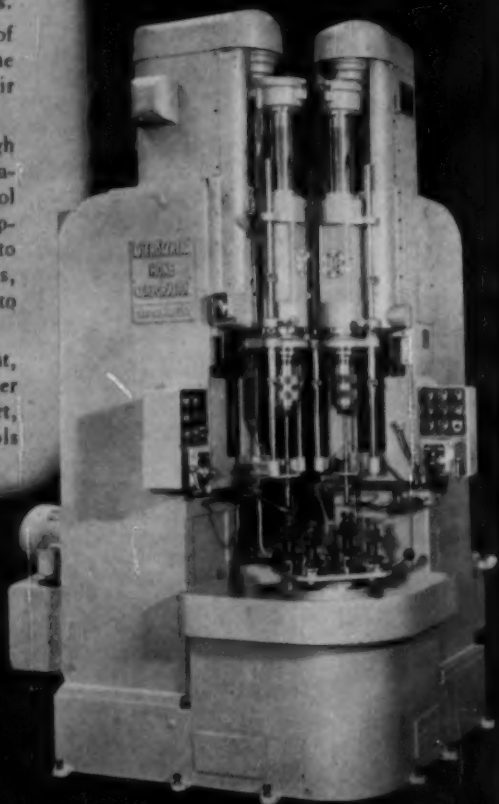
*The man who needs a new machine tool and doesn't buy it is paying for it anyway...*

**in high maintenance costs**

**LOOK** beyond the age of your equipment when considering whether maintenance costs indicate your need for new machine tools. The design of equipment and the method of processing used are equally important factors. For example, fast spindle speeds and the necessity of maintaining perfect alignment between spindle and the fixture or chuck, call for frequent adjustment, repair and replacement of parts.

You can greatly reduce such maintenance costs through the Microhoning\* process—which employs comparatively slow spindle speeds and self-alignment of tool and workpiece. And the design of Microhoning equipment makes easily accessible all components likely to require servicing... follows industry-accepted standards, such as the J.I.C. electrical and hydraulic codes, to provide greater safety to both operator and machine.

In reviewing your processing methods and equipment, you may discover your maintenance costs are greater than the price of new Microhoning equipment. In short, you may be paying right now for new machine tools you don't have.



**PART:**

Cluster gear—bore must be straight and concentric with gear teeth.

**PROBLEM:**

Excessive maintenance costs on fixture driver and chucks.

**SOLUTION:**

**MICROHONING**—Simple stationary fixture—self-aligning tools—straight bore concentric with gear teeth—increased production.

\*MICROHONING = STOCK REMOVAL + GEOMETRY + SIZE CONTROL + SURFACE FINISH

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Hydraulic controls • Diesel fuel injection equipment

Visit Booth 1211 at the Show.  
See other examples of how  
Microhoning saves on maintenance.





# UNITED

## 35,000 TON FORGING PRESS



**A** NEW 35,000 ton hydraulic forging press being built by UNITED for the USAF Heavy Press Expansion Program to help bring the United States to a commanding position in the production of modern aircraft for the armed services.

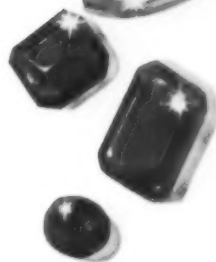
# UNITED

ENGINEERING AND FOUNDRY  
COMPANY

*Pittsburgh, Pennsylvania*

Plants at: Pittsburgh • Vandergrift • Youngstown • Canton  
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Subsidiaries: Adamson United Company, Akron, Ohio  
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Designers and Builders of Ferrous and Non-Ferrous Rolling Mills,  
Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and  
other heavy machinery. Manufacturers of Iron, Nodular Iron and  
Steel Castings and Weldments.

**for your  
day-by-day requirements**

1955	may					1955
sun	mon	tue	wed	thu	sat	
						7
						14
						21
						28

**RELIANCE**  
*Job-Fitted*  
**ready-to-use  
SHEET and STRIP  
STEEL**

**Can we be useful to you?**

## RELIANCE STEEL

**DIV. DETROIT STEEL CORPORATION**

### Processing and Distributing Plants

CLEVELAND PLANT, CLEVELAND 27, O. Vulcan 3-3600  
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### Reliance Customer Representative Offices

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York, N. Y., St. Louis, Mo., Toledo, O., Worcester, Mass.



T.M. REG. U.S. AND CANADA  
DEPENDABLE DAN

**RELIANCE**  
*Job-Fitted*  
**PRODUCTS**

### COLD ROLLED STRIP STEEL

Coils • Cut Lengths • All Tempers

### SHEETS

Cold Rolled • Hot Rolled • H.R. Pickled  
Galvanized • Long Terme  
Standard or Production Sizes  
Sheared or Slit to Actual Working Dimensions

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(ANOTHER ACTUAL EXAMPLE)

### THE JOBS

Engine bearing backs

### THE STRIP

GAUGES:..... .050" to .156"

THICKNESS TOLERANCES:.....  $\pm .001$ "  
(for all specified sizes)

WIDTHS:..... 4" to 9"

### QUANTITY

SHIPPED (during 1954).... 1,225,589 lbs.

### RETURNS AND

ALLOWANCES (on above).... 1,685 lbs.



## ON-THE-JOB PERFORMANCE... 99.86%

Such near-perfect performance is unusual. Yet, of all our customers who took in more than 500 tons of DSC Strip during 1954, 62% of them experienced on-the-job performance of better than 99%—some even 100%—in a year when total inspection was the rule!

The example given is unusual in itself. Maximum permissible thickness variation on all specified sizes was  $\pm .001$ " or  $.002$ " overall. This is "more restricted than standard" by as much as 66⅔%. Compare this with the standard tolerances shown in the following tabulation:

### ORDERED THICKNESS

From	To (incl.)
.050"	.068"
.069"	.099"
.100"	.160"

### STANDARD OVERALL TOLERANCES

4" to 6" (incl.)	Over 6" to 9" (incl.)
.005"	.005"
.005"	.006"
.006"	.006"

WHAT DOES IT PROVE?—That in the long run—when the tools, the job and the steel are properly mated, DSC Strip consistently meets or beats recognized standards for strip performance.

How about talking over your requirements?

Just call your nearest DSC Customer Representative.



## DETROIT STEEL CORPORATION

GENERAL SALES OFFICE—DETROIT 9, MICHIGAN

### DSC CUSTOMER REPRESENTATIVE OFFICES

Chicago, Cincinnati, Columbus, O., Dayton, O., Detroit, Grand Rapids, Mich.,  
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### DSC MILL PRODUCTS

Hot Rolled and Cold Rolled Sheets

Cold Rolled Carbon Steel Strip Flat Cold Rolled Carbon Spring Steel  
Low and Medium Carbon Manufacturers' Wire High Carbon Specialty Wire  
Aluminum Cable Strand Reinforcement Rope Wire Tire Bead Wire  
Welded Wire Fabric

## IN FURTHERANCE OF THE METAL STAMPING INDUSTRY



Planning a Fall trip this year?


Why not combine business and pleasure by attending

THE PMI ANNUAL MEETING—GROVE PARK INN, ASHEVILLE, N. C.

for complete details write to

PRESSED METAL INSTITUTE, National Assn. of Metal Stampers, Cleveland 20, Ohio

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**easiest,  
fastest way to  
insulate for  
temperatures up to  
3100°F**

ALFRAX® castable aluminum oxide cements are just about the most effective insulating materials you can find for temperatures up to 3100°F—and especially so at the upper end of the temperature range. They consist of tiny bubbles of pure alumina held together by a bonding agent.

These castables make ideal back-up linings for nonferrous crucible furnaces and for the sidewalls of reverberatory furnaces. Or you can cast them into burner blocks for core ovens and malleable annealing furnaces. Aluminum oxide is one of the most stable and inert of all materials . . . is highly resistant to practically all furnace conditions. And to use, all you do is mix it with water and pour.

So, if you're looking for a castable insulating material to stand really high operating temperatures . . . and keep on standing them through a long, useful life . . . you can end your search right now by writing us for free engineering information on these highly refractory, low heat capacity, easy-to-use cements. Address Refractories Division, The Carborundum Company, Perth Amboy, N. J., Department B55.

Here's why ALFRAX cement insulates so well:  
A sliced-through section of set cement reveals the secret: dead air space in the thousands of closely-packed bubbles of alumina.

**CARBORUNDUM**

Registered Trade Mark

# Fallacies and Facts for Cemented Carbide Users

A few blunt—but needed—clarifications by the manufacturers of Carboloy Cemented Carbides

When you buy carbides, you're really buying *production ability*. You're buying *what carbides will do in your shop in terms of metal removal*.

If you're a tool engineer or designer, production foreman or machinist, you translate this into feeds, speeds, and depths of cut.

If you're in operating management, you also look for production ability, but you pinpoint it under the heading of greater machine efficiency, decreased downtime and lower tool inventories.

If you are a purchasing agent, your primary concern is getting the most for your money—but "most" in terms of production ability.

And, if you're in the top management group, your terms for production ability are: greater return on capital investment; decreased unit costs and increased gross margins.

## The fallacy of overemphasizing the "Quickie Deal"

Be wary of the "quickie deal" involving price or discounts. You don't purchase with *production ability* in mind when you fall for these. Reason: while carbides look alike, *they don't perform alike*. And because of this fact, they can't be used interchangeably to bring the same on-the-job results. Their production ability varies—in some instances, tremendously.

## The fallacy of the so-called "Industry Standard" Chart

Be wary, also, of the carbide salesman who shows a so-called "industry standard" carbide grade selection chart and says that each producer's grade within a category will perform equally well. They won't, because these are merely recommendation charts, *not "equivalent" or "comparison" charts*. Like most other products, carbides are made by different manufacturing processes and techniques, with varying degrees of engineering know-how and quality control exerted during processing. (Carboloy has one carbide engineer in its home office for every two salesmen in the field!)

## The fallacy of using "Carboloy" to mean any brand of cemented carbide

And be wary of the salesman who tells you that his company makes "Carboloy." Unless he's one of our 70

field sales engineers or a representative of our 130 Authorized Distributors, his claim is in error. The name "Carboloy" is our registered trademark. It cannot be used synonymously with "cemented carbides" because it refers to one brand, and to one brand alone—*Carboloy cemented carbides*.

However, we do frequently receive complaints from people who say they have been sold "Carboloy," when they actually got another brand of cemented carbide that could not equal true Carboloy cemented carbide in *production ability*. Having our name used so freely by others is, we suspect, a problem that might come under the heading of "The Penalty of Leadership."

## The facts about the need for advanced carbide engineering

Another facet of the responsibility that goes with leadership in the carbide industry, is the continuing engineering program carried on by our organization to prevent what might be termed a stagnant technology in the carbide field.

You, the user, impose ever-increasing demands on cemented carbides. And this advanced Carboloy development program is a major factor in keeping this vital phase of metallurgy ahead of the requirements you impose.

This emphasis on technical progress—resulting most recently in the new Carboloy Series 300 carbides—is another of the plus factors built into our product that the user can't always see.

## The facts you can determine for yourself

We offer this suggestion—when you buy or use carbides, find out for yourself which carbide will give you the most production. If you care to, ask a Carboloy sales engineer to help you run the tests—but *you* set them up, in *your own shop*. Then compute your carbide cost based on *production ability*.

We have hundreds of in-plant case histories proving what our grades will do under any operating conditions. They show you how you get more for your carbide dollars when you specify *Carboloy* cemented carbides from your distributor or toolmaker. Write, or call, for assistance in getting the most out of your tooling dollars.

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company

# CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11153 E. 8 Mile Blvd., Detroit 32, Michigan

**Carboloy Created-Metals for Industrial Progress**





**In this heat exchanger for gas furnaces**

## **Switch to USS COR-TEN Steel extends service life 2 to 3 times**

The superior resistance to atmospheric corrosion provided by USS COR-TEN Steel pays off in several ways for the Hall-Neal Furnace Company, Indianapolis, Ind.

This company makes the Victorgas unit, a heat exchanger for domestic gas furnaces. When built of plain carbon steel these units were quite vulnerable to corrosion, and service life was not as long as desired. Corrosion was encountered when furnaces were down during the summer months. Damage due to condensation of water vapor and the products of gas combustion was particularly severe in intermittent service.

By changing to USS COR-TEN Steel, which has 4 to 6 times the atmospheric corrosion resistance of carbon steel, it was possible to extend the service life of these units 2 to 3 times. This achievement not only pleases the furnace makers but makes for greater customer acceptance and helps to boost furnace sales.

USS COR-TEN Steel's ability to form and weld readily, and to safely withstand furnace temperatures up to 1000° F. are other advantages which, added to superior corrosion resistance, far offset its slightly higher cost.

## **USS MAN-TEN Steel used in portable scaffolds reduces weight 19%, provides greater strength and durability**

These portable work scaffolds manufactured by Baker-Roos, Inc., Indianapolis, Ind., are adjusted and moved more easily, and are more rugged and durable because side rails were redesigned to incorporate USS MAN-TEN Steel.

Used by builders, painters, electricians, carpenters and maintenance men in all types of off-the-floor work, the "no X-brace" construction of Baker-Roos scaffolds allows them to span furniture and equipment so that regular production will not be interrupted in occupied areas.

This type of construction and function requires a combination of strength and light weight for maneuverability. To improve the scaffold in these respects, the side rails were changed from carbon steel angles,  $1\frac{1}{2}" \times 1\frac{1}{2}" \times \frac{3}{16}"$ , to a section formed from MAN-TEN Steel hot rolled strip,  $.0747" \times 5\frac{1}{2}"$ .

This has reduced side rail weight 19% making it easier to shift the scaffold from job to job. And even though USS MAN-TEN Steel is used in lighter sections, the fact that this steel is one and a half times stronger than carbon steel and has 40% higher fatigue strength ensures a stronger and more durable side rail than before.



**NOW AVAILABLE . . .** Our new "Design Manual for High Strength Steels" is ready for distribution. This excellent book contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels. For your free copy, write on your company letterhead, giving your title or department, to United States Steel Corporation, Room 4722, 925 William Penn Place, Pittsburgh 30, Pa.

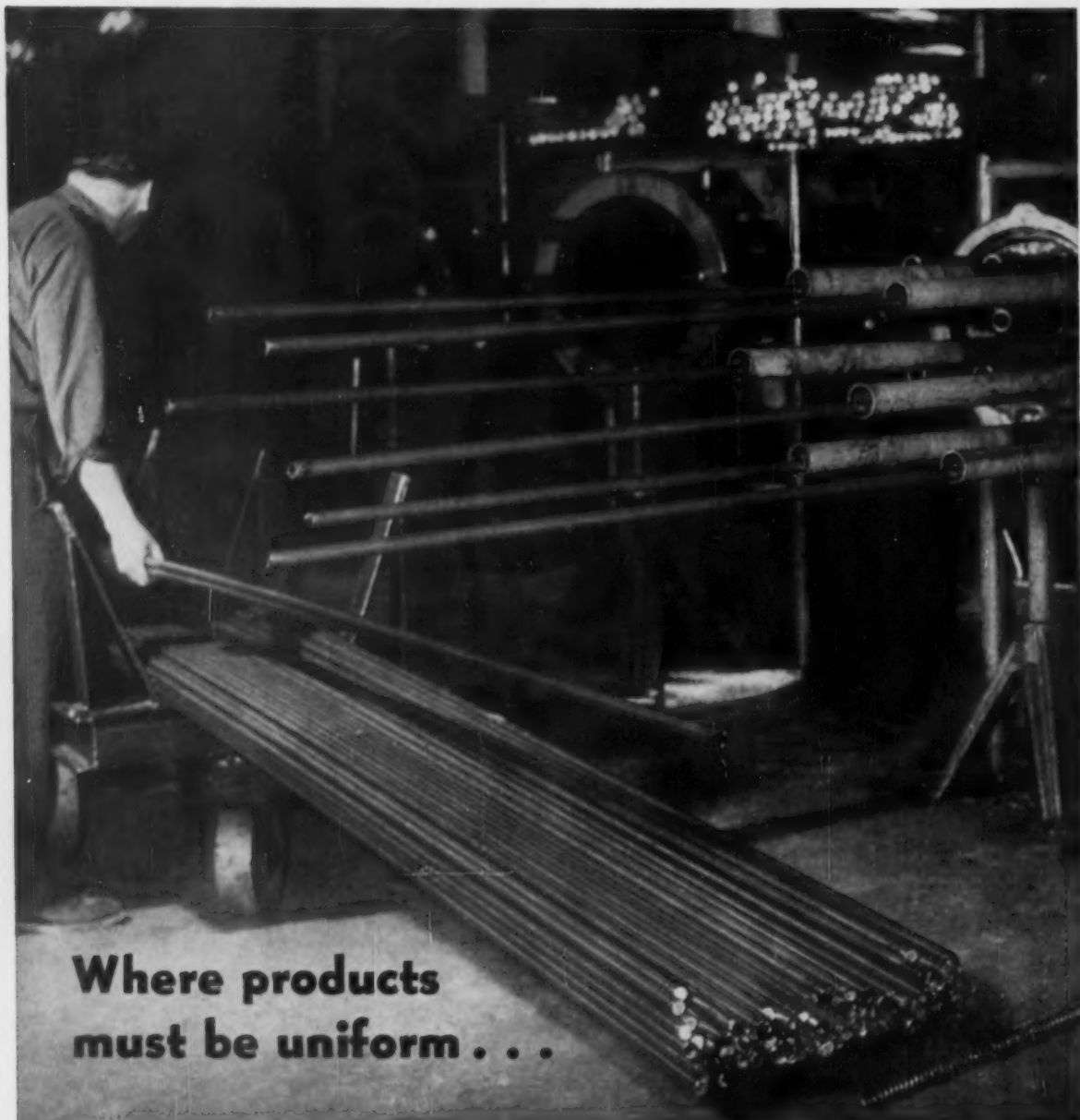
UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO  
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

# **USS HIGH STRENGTH STEELS**

USS MAN-TEN • USS COR-TEN • USS TRI-TEN



**UNITED STATES STEEL**



**Where products  
must be uniform . . .**

**SPECIFY**  
***Youngstown***

**COLD FINISHED CARBON AND ALLOY STEEL BARS**



●It takes steel bars of uniform quality to turn out uniform products. That's why so many shops prefer Youngstown Cold Finished Carbon, Yolead and Alloy Steel Bars.

With Youngstown, uniformity starts in the Bessemer or Open Hearth. It is maintained throughout manufacture by men trained to work to exact specifications, checked at every step by close inspection. The name Youngstown is your best assurance of uniformity in screw machine stock.

**THE YOUNGSTOWN SHEET AND TUBE COMPANY**

*Manufacturers of  
Carbon, Alloy and Yolead Steel*

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT  
AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE -  
HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES



Roebling drum packs are shipped on pallets unless otherwise specified. This gives you today's easiest, least expensive method of moving and stacking wire — with a fork truck, one man can do the work of ten.

## Packed to save you money!

IN ADDITION to producing top quality high carbon wire, Roebling has developed many special methods of packing ...and some *one* of these, or some other method which may be developed for your specific requirements, may save a considerable amount of time and money in your plant.

Certain types of wire, for instance, can be packed in hexagonal fibre drum packs that provide superior protection and facilitate handling and storing wire. Drum packs do not have to be returned ...save you bother, storage space and freight charges.

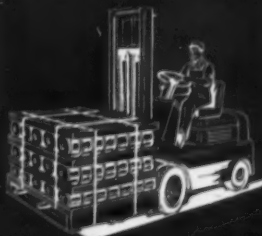
You *pay* for the best when you buy high carbon wire. Make sure you *get* the best, in wire and packing too. Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.



**ROEBLING** 

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • ROCHESTER, 1 FLINT ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 221 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.



If you wish, Roebling spools will be delivered on pallets with separators, providing the easiest and most economical means of handling and stacking wire with fork truck.

# There's only one **T** lathe

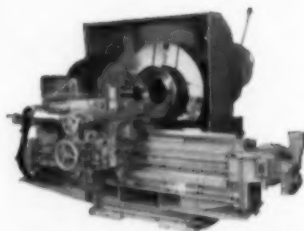


...designed and  
perfected by  
**Lodge & Shipley**  
for ANY thin-wall,  
short length,  
large diameter work

Now used by scores of manufacturers in several countries, Lodge & Shipley T Lathes are setting notable records for productivity, accuracy and versatility. Particularly in the manufacture of jet engine parts and in other industry, T Lathes are solving the problem of facing, turning and boring thin-wall section work of large diameter and short length.

Far faster, more sensitive and much more accessible, T Lathes are more compact, cost far less than oversize lathes or boring mills formerly used.

Like other manufacturers in many industries, you may find good profit possibilities in a Lodge & Shipley T Lathe. Write for Bulletin 215. The Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio.



Illustrated is the type O, the most universal single carriage type T lathe. Other types available with single or double carriages and with various Copy-matic tracer control arrangements.

**Lodge & Shipley**  
....your **LODGE-ical** choice!





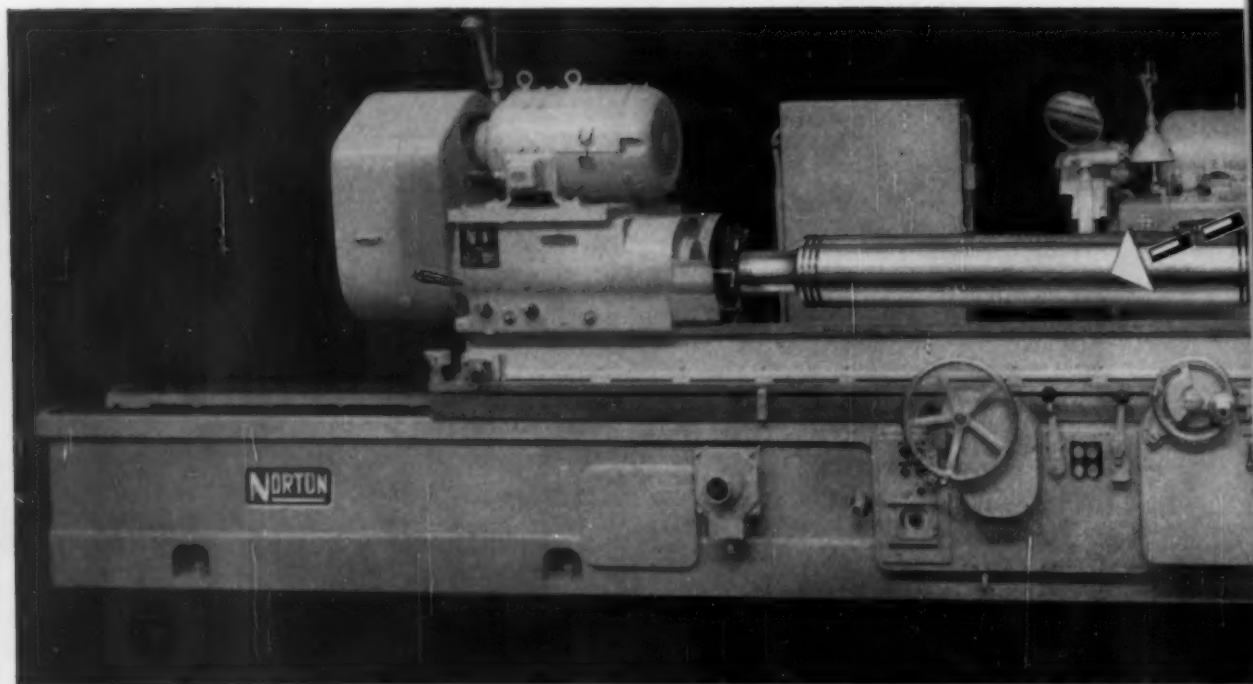
*Engineering Company Inc.*  
Warren, Ohio . .



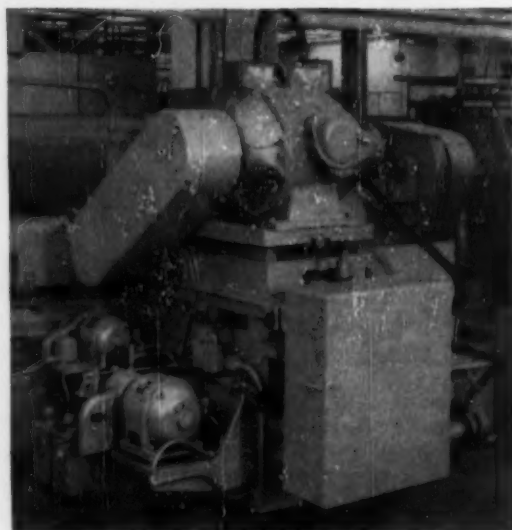
**T**HE Wean Engineering Company, Inc., Warren, Ohio, is a recognized specialist in the design and installation of sheet, tin and strip mill equipment. The expert knowledge and trained imagination of one of the world's most noted steel mill engineering firms is at your service when you specify Wean — whether the job calls for a single piece of equipment or a complete design of an entire line.

**SPECIALISTS  
IN SHEET, TIN  
& STRIP MILL  
EQUIPMENT**

# Here's a heavy duty grinder



**Easy To Set Up And Operate.** All controls in front for minimum set-up time, quick change-over and no reaching by operator. Graduated wheel hand feed indicates feed. "Click-counter" signals adjustment for each .0001" reduction in work diameter. Table-truing and grinding speeds may be pre-set, and obtained by selector lever.



**Easy To Maintain.** All maintenance points on outside. Pumps, motors, filters, lubrication valves and all reservoirs easily accessible. Electrical controls grouped for easy inspection and enclosed for protection.

that can produce

*bigger  
profits  
for you*

**NORTON C-2 CYLINDRICAL  
GRINDING MACHINE**

Semiautomatic or plain in 18" or 24" swing — work lengths 48" to 240". Also available with roll grinder arrangement. Unequalled for such work as railroad car axles, diesel crankshafts, rolls, gun barrels, etc.

The new  
Norton C-2  
Cylindrical  
Grinder is  
available in  
3 arrangements:  
Plain  
Semiautomatic  
Roll

*Faster cutting . . . quicker set-up . . . easier operation . . . less down time*

This is the kind of grinding machine you expect from Norton — one that's tops for accuracy, production rate and ease of operation.

The new C-2 gives you more heavy production because it works more of the time — and works faster and easier.

When arranged for Semiautomatic operation all your operator does is to move a single lever for automatic grinding to exact size and finish.

When arranged as a Roll Grinder the famous Norton tilting wheel head mechanism is supplied. This moves the grinding wheel contact point away from or toward the axis of the roll as the roll is traversed past the wheel face.

Remember: only Norton offers you such long experience in both grinding wheels and machines, to help you produce more at lower cost.

Your Norton Representative will be glad to give you all the facts on the new C-2 and to discuss your grinding problems. Or write direct to NORTON COMPANY, Machine Division, Worcester 6, Mass.

To Economize, Modernize With NEW

**NORTON**  
GRINDERS and LAPPERS

*Making better products . . . to make other products better*

District Sales Offices: Worcester • Hartford • New York (Teterboro, N. J.)  
Cleveland • Chicago • Detroit  
In Canada: J. H. Ryder Machinery Co., Ltd., Toronto 5

# YOUR TURNING-TIME CONCEPTS

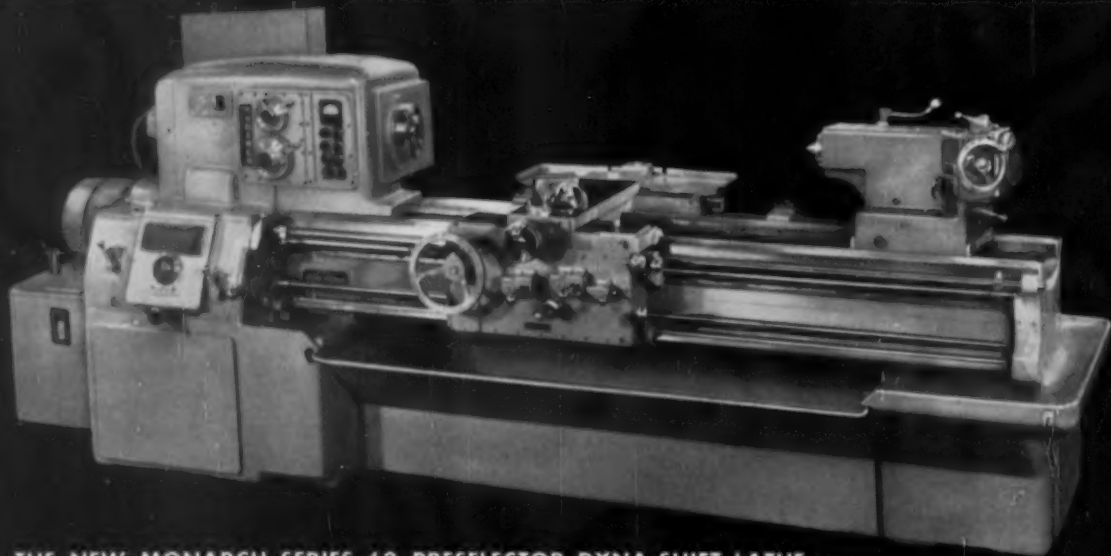
Set it—forget it! That's the story of the Preselector Dyna-Shift. It's the brain Monarch has built into the new Series 62. With it *this* machine will give a greater ratio of metal removing hours to work hours than you ever dreamed possible.

When setting up, merely dial the surface speed wanted and the first diameter to be turned—the Dyna-Shift computes the R.P.M. and makes the shift instantaneously and automatically. (*Time-saver #1*). Then, to maintain this surface speed on successive diameters, set the work diameter selectors. Every speed change thereafter, on every piece in the run, takes place automatically with but one fast dial setting and movement of the work start and stop lever. (*Time-saver #2*). What's more, here at last is the lathe with a speed range so wide as to take care of all your needs. Its

20 H.P. drive gives you 36 different spindle speeds in a range from 14 to 1750 R.P.M., a ratio of 1 to 125. (*Time-saver #3*).

Nor are the time-saving features of the Series 62 limited to the Pre-selector Dyna-Shift headstock. There's four-way power rapid traverse which cuts tool positioning time on the average of 50%. There's the totally enclosed and automatically lubricated gear box and end gearing. There's a completely new two speed tailstock. Add them all up and you get a new lathe concept that means Production with a capital P!

You will want to know all about these and many other features in detail. Send the coupon for the greatest turning news in years!! . . .  
**The Monarch Machine Tool Company, Sidney, Ohio.**



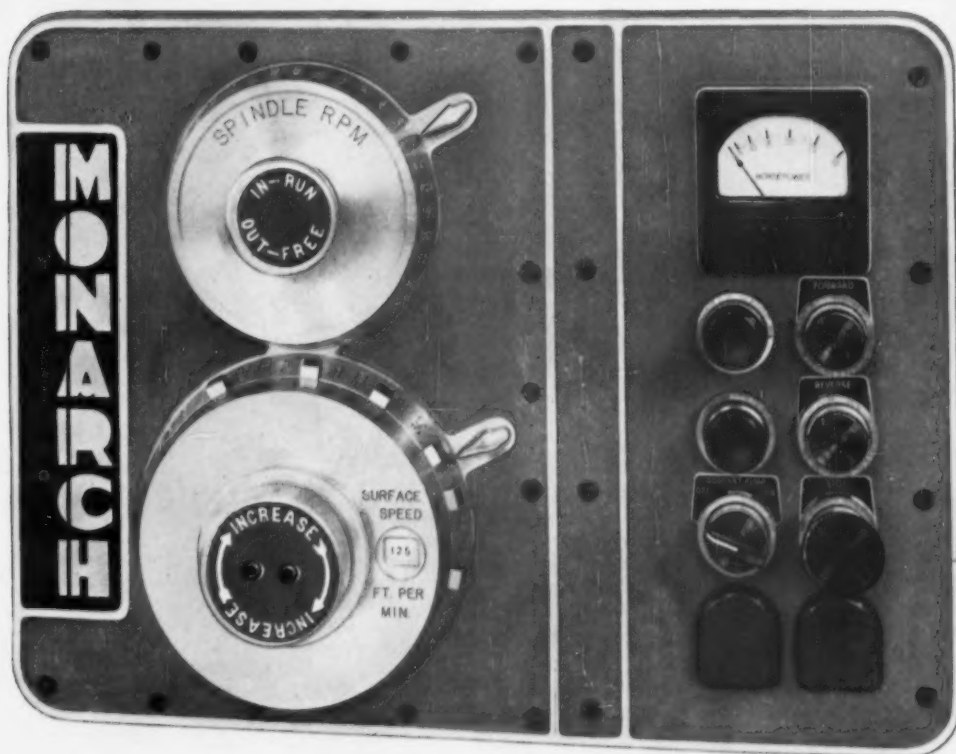
**THE NEW MONARCH SERIES 62 PRESELECTOR DYNA-SHIFT LATHE**

Models 130 and 1130 (above)—13" swing over cross slide, 20" clearance diameter.  
Models 131 and 1131—16" swing over cross slide, 24" clearance diameter.



# ARE IN FOR A SHOCK!

See the New Monarch Series 62 Preselector Dyna-Shift —  
Unequaled for Speed and Ease



FOR A GOOD TURN FASTER  
...TURN TO MONARCH

THE MONARCH MACHINE TOOL COMPANY, Sidney, Ohio  
Gentlemen:

- ☐ I am interested in your Series 62 story. Please send me your illustrated Booklet #1501 with complete data.
- ☐ Please have a Monarch sales engineer call on me.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

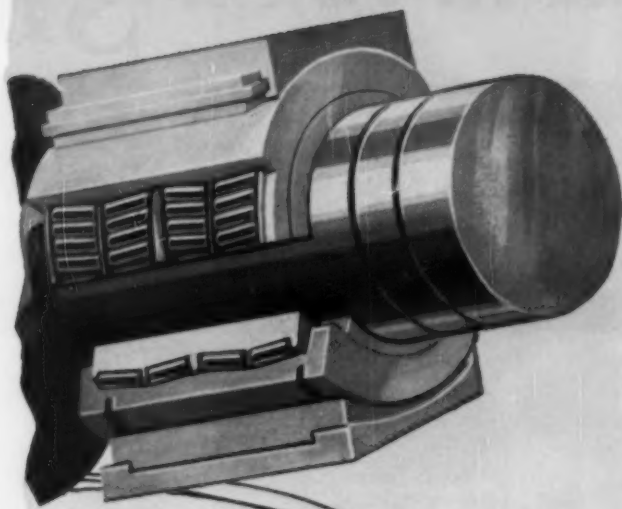
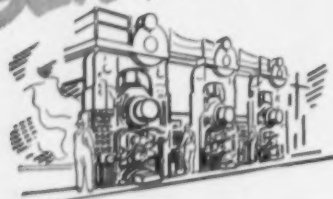
COMPANY \_\_\_\_\_

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CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

**FILL OUT COUPON—**and attach to  
your business letterhead, please.

**FOR  
SEVEREST  
ROLLER  
BEARING  
SERVICE**



**BROOKS \*  
LEADOLENE**

**375**

**\*THE I.P. LUBRICANT WITH *Indestructible pH-ilm***

Brooks Leadolene 375 provides safe, trouble-free lubrication of roller bearings under heaviest loads, overloads and severest shock conditions, such as experienced in heavy duty work roll service on 4 high hot strip mills, reduction mills and temper pass mills. Developed through years of research, this modern industrial lubricant provides corrosion resistance to component parts of bearing from cooling water and other contaminating actions.

Available in three grades . . .

**Leadolene 375 Light:** For normal or moderately high temperatures, with repulsion of water a dominant factor. Excellent pumpability.

**Leadolene 375 Medium:** For heavier load and higher temperature requirements. Prevents leakage through seals. Excellent pumpability. Affords year around service under all temperature conditions.

**Leadolene 375 Heavy:** For pressure gun or system applications in normal or high temperatures. Good pumpability.

A Brooks lubrication engineer will gladly call at your request. Write, phone or wire today.

THE BROOKS OIL COMPANY  
934 Ridge Avenue  
Pittsburgh 12, Pa.

Please send bulletin on Leadolene 375.

NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_  
I.A. 165

MAIL COUPON FOR COMPLETE DATA

**The Brooks Oil Company**

Since 1876

Executive Offices and Plant, Cleveland, Ohio  
Executive Sales Offices, Pittsburgh, Pa.  
Canadian Offices and Plant, Hamilton, Ontario  
Cuban Office, Santiago de Cuba  
Warehouses in Principal Industrial Cities

# **FOUR REALLY TOUGH MUELLER BRASS CO. REFRACTORY BRONZE ALLOYS IN ROD FORM**



## **"TUF-STUF" ALUMINUM BRONZE "600" SERIES BEARING BRONZE MANGANESE BRONZE ALUMINUM SILICON BRONZE**

These four Mueller Brass Co. alloys have been specifically formulated to meet the demands of applications where manufactured parts must stand up under the most adverse operating conditions. While these alloys are tough, they are relatively easy to machine. Parts made from these alloys are in dependable daily service and range from marine hardware to valve guides in aircraft engines. As specialists in brass and bronze alloys, the Mueller Brass Co. can offer you the exact alloy best suited to meet the requirements of any application problem. Write us today for details.

NAME OF ALLOY	ALLOY NO.	YIELD STRENGTH AT 0.2% EXTENSION LBS./SQ. IN.	TENSILE STRENGTH LBS./SQ. IN.	ELONGATION % IN 2 IN.	BRINELL HARDNESS	RELATIVE MACHINABILITY - FREE CUTTING BRASS = 100%	ALLOY CHARACTERISTICS
TUF-STUF ALUMINUM BRONZE	224-E	60,000	90,000	15	175	30	Resists oxidation and retains strength at elevated temperatures. Lightweight. Used in aviation industry.
TUF-STUF ALUMINUM BRONZE	224-C	62,000	95,000	9	185	35	Properties generally higher than 224-E. Non-Galling. Acid and corrosion resistant.
MANGANESE BRONZE-A	241-A	55,000	78,000	20	150	25	High torque resistance. Tough. For screw machine parts and forgings - valve stems, balls, airplane parts.
MANGANESE BRONZE (HIGH TENSILE-GRADE B)	721	68,000	115,000	10	200	35	Highest strength of the copper base alloys. Good shock and wear resistant properties. Used for rollers, rotors, valve stems.
FORGEABLE BEARING BRONZE	600	40,000	78,000	15	165	25	For use where excessive pounding action encountered. Excellent bearing properties. For bushings, gears, marine hardware, etc.
FORGEABLE BEARING BRONZE	602	40,000	74,000	12	150	65	Used with hard or soft mating members that do not have a high polish. Modification of 600 alloy-for use where difficult machining is necessary.
ALUMINUM SILICON BRONZE	802	45,000	90,000	15	175	65	Excellent machinability for high strength bronze. Corrosion resistant. For pole line hardware. Non-magnetic.

**MUELLER BRASS CO. PORT HURON 24, MICHIGAN**



**X** is the mark of  
*Extra Quality...and*  
**AMERICAN PHILLIPS**  
*Quality pays back*  
*its cost...many*  
*times*  
*over*

Customer-loyalty is mostly good business sense. And that's why so many makers of quality merchandise stay with American Phillips year in and year out . . . why a furniture-builder and an organ-maker, for instance, have been standardized on this modern fastening method ever since American first introduced the Phillips Screw to industry. *Here's the point:* If old-fashioned slotted screws really cost less to use, and fulfilled quality standards, then these cost-minded manufacturers would have returned to them long since. But they have found that American Phillips economies . . . easier handling, faster driving, better fastenings, no spoilage or accidents . . . pay back the cost of American Phillips Screws *with interest*, over and over again. And an economy-test on *your* operation may well uncover opportunities for savings in assemblies as much as 50% over present methods. American engineers are ready to go into this with you . . . *any time you say.*

**X** marks the spot . . . the mark of extra quality

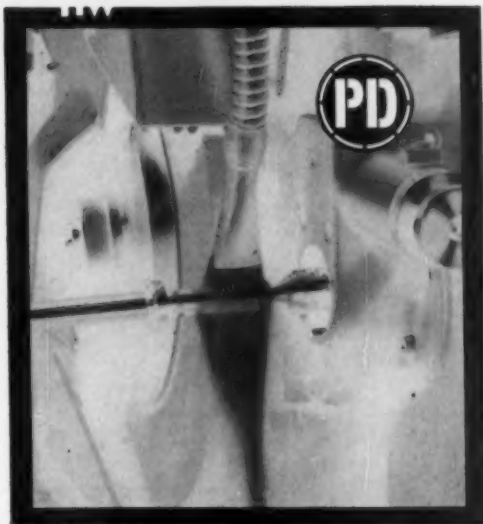
## AMERICAN SCREW CO.

PHILLIPS HEADQUARTERS  
 WILLIMANTIC, CONNECTICUT

Plants at Willimantic, Conn. and at Harrisburg, Pa.  
 Warehouse and office at Chicago  
 Office, Detroit, Michigan







**Save money and increase production through this remarkable development..**

◀ JUST AS A NEGATIVE guarantees you an exact duplication of a photograph each and every time, you are always assured a . . .

. . . POSITIVE DUPLICATION of an original grinding wheel each and every time through the CINCINNATI (PD) Manufacturing Process.

**NOW!**  
**Cincinnati Grinding Wheels**  
**offer**



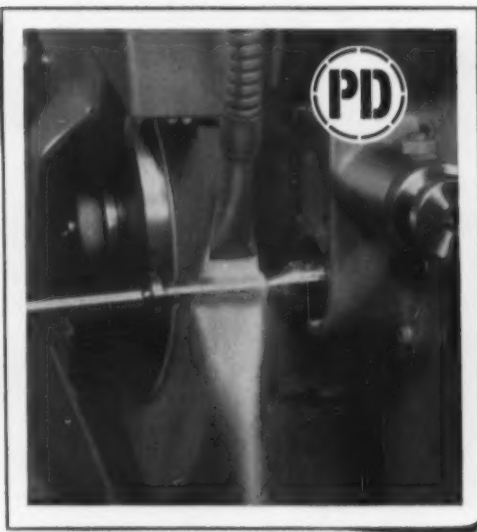
**Positive Duplication**

Here is the most talked about advancement in grinding wheels in years. And no wonder! Positive Duplication is an outstanding achievement in precision manufacturing and quality control that absolutely can *save you money . . . and increase your production.*

Through the CINCINNATI (PD) Manufacturing Process you are assured a Positive Duplication of the original wheel *every time* you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS are priced no higher than ordinary wheels.

We'll be glad to prove to you how CINCINNATI (PD) WHEELS can save you money and increase your pro-



duction. Just contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.



*Win* **\$500** FIRST PRIZE

*enter the 1955*

## **GRAY IRON REDESIGN CONTEST**

**2ND PRIZE \$250**

**3RD PRIZE \$100**

Make your redesign ideas pay off in cash! You are eligible if you have redesigned a product or part for production in gray iron which economically and efficiently replaced a competitive material. Regardless of how simple or complex your entry may be, you have a good chance of winning.

### **FOLLOW THESE EASY CONTEST RULES**

1. Select the best example of products or parts that you have redesigned for production in gray iron.
2. Give all facts leading up to your redesign . . . why you thought of gray iron . . . how much was saved in labor and/or material costs . . . how much efficiency was gained and any other factors leading to your decision.
3. Submit an 8" x 10" glossy photo of the gray iron casting with your entry. If possible, also submit a similar photo of the original design.
4. Your entry must be in the mail by July 1, 1955 the contest closing date. Address: Redesign Contest, Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio.
5. Contest is open to all persons engaged in the metal-working trades . . . entries may be made jointly by two or more individuals. Awards will be made at the 27th annual meeting of the Society in Milwaukee, Oct. 21, 1955.

**These examples of previous award winners show how easy it is to be a winner yourself . . .**



Make it better  
with Gray Iron



22 parts were eliminated  
when the fabricated design  
of this hydraulic circuit was  
redesigned in gray iron.



Redesigning this table  
top in gray iron saved  
15 hours in produc-  
tion time.

Original costs were re-  
duced 83% by redesign-  
ing this screw nut as a  
cored gray iron casting.



# **GRAY IRON FOUNDERS' SOCIETY**

**B&W  
ALLMUL**  
with  
electrically  
fused grain  
for . . .

# Stamina in Tough Service

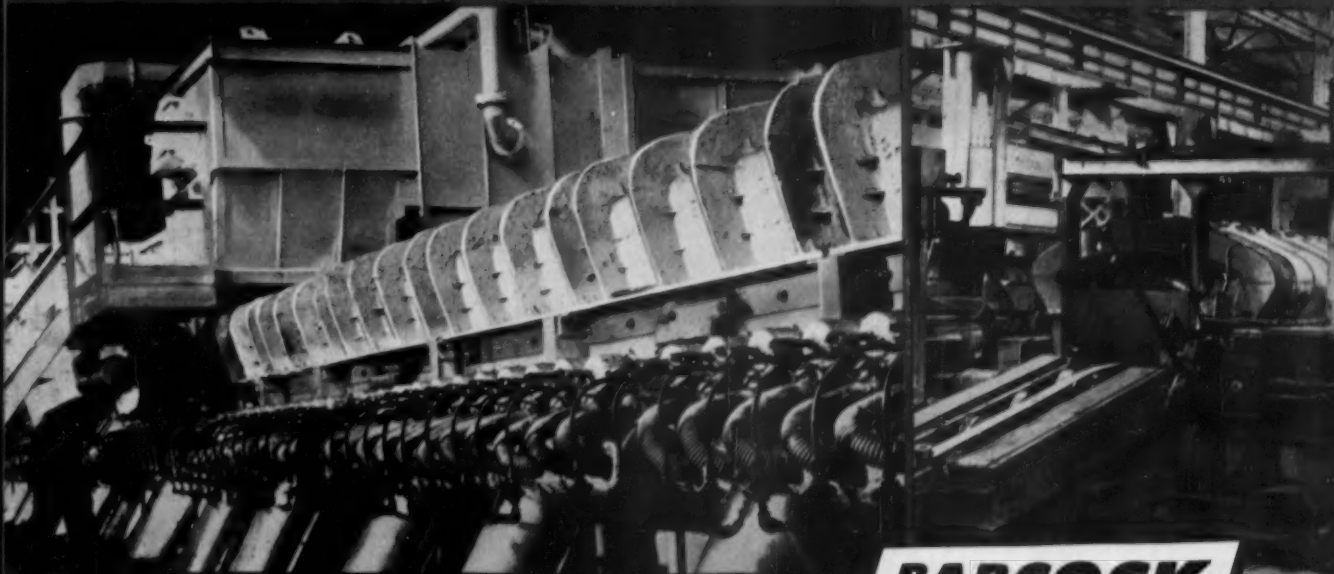
B&W Allmuls are used in many different kinds of heavy-duty furnaces. This example happens to be a butt weld furnace for continuous high speed welding of pipe. In the hottest areas (3000°F or more), a mullite-type brick lasted only six weeks. Cause of failure: spalling, aggravated by metal penetration.

At the same locations, B&W Allmuls, made of electrically melted grains, lasted a full year—or more than eight times as long. It's by no means strange that the furnace operator now uses Allmuls for hoods, burner blocks, uptake arches and sidewalls, crossovers and furnace sidewalls.

Allmuls are volume produced by a highly efficient pro-

cess. That's how you get—at relatively low first cost—top quality, fused-mullite brick with these properties: high hot load strength, high resistance to spalling, good volume stability, and a melting point of 3435°F. Whatever you're processing—steel or other metals, ceramics or chemicals—if your furnace demands a lining that can really take punishment, it will pay you to get complete facts on B&W Allmul. May we send you additional information?

A Close-up view of butt weld furnace where electrically-melted B&W Allmul has replaced mullite-type brick. B Another view of butt weld furnace — charging end.



B&W REFRACTORIES are made with B&W Allmul, Firebrick • B&W Allmul

• Firebrick • B&W Insulating Firebrick • B&W Insulating Firebrick • Firebrick • Firebrick

• B&W Insulating Firebrick • B&W Insulating Firebrick • B&W Insulating Firebrick

• B&W Insulating Firebrick • B&W Insulating Firebrick • B&W Insulating Firebrick

• B&W Insulating Firebrick • B&W Insulating Firebrick • B&W Insulating Firebrick

**BABCOCK  
& WILCOX**

THE BABCOCK & WILCOX CO.  
REFRACTORIES DIVISION

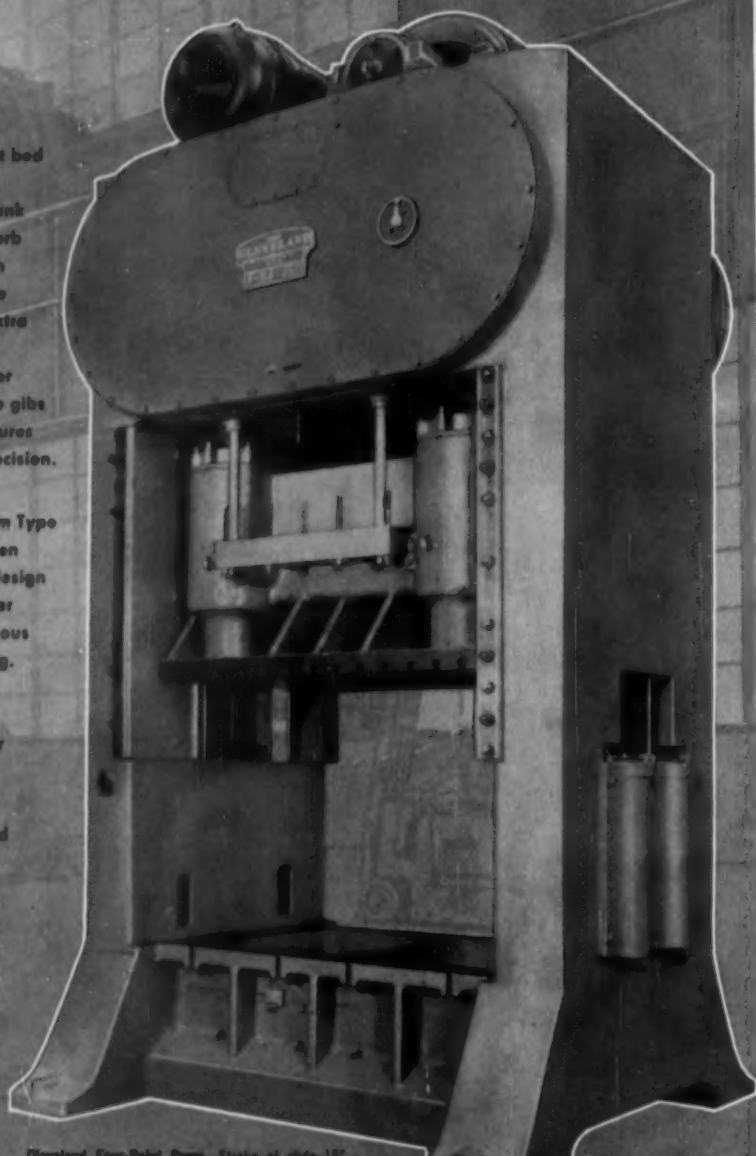
GENERAL OFFICES: 181 EAST 42ND ST. NEW YORK 17, N.Y.  
WORKS: AUGUSTA, GA.

# You get both High Production and Dependable Precision with new **CLEVELAND** Presses!

Every Cleveland Four-Point Press features an extremely rugged construction. The cast bed and uprights are secured to the crown by tie-rods that have been heated then shrunk into place. These rods meet the frame, absorb all stress. These presses are designed with an ample margin of safety over and above rated capacity. All slides are fitted with extra long bearing surfaces to insure accurate guidance during entire slide stroke whether the load is "on center" or "off center." The gibs are readily adjustable. These design features assure lasting accuracy for dependable precision.

Our trouble-free (patented) Cleveland Drum Type Friction Clutch and Brake have been proven ideal for high production operation. The design and lightness of parts contribute to quicker starting and stopping. You get instantaneous slide control at all times and perfect timing. Costly down-time due to clutch failure is virtually eliminated. Its light-weight construction and cool-running design offer important power savings.

Many companies have already discovered important operating economies gained with new Cleveland Presses. They'll produce profits for you, too! Just write or call. A Cleveland sales engineer will gladly help you select the right Cleveland for your requirements. He'll show you why a Cleveland is your best buy.



Cleveland Four-Point Press—Stroke of slide 18", adjustment of slide 12", shut-height 54", bed and slide area 60 x 84", capacity 450 tons.

THE  
**CLEVELAND**  
PUNCH & SHEAR WORKS CO.

Established 1890

POWER PRESSES  
FABRICATING TOOLS

240TH & ST. CLAIR AVENUE CLEVELAND 14, OHIO  
BRANCHES IN NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • ST. LOUIS • PITTSBURGH  
CITY FOUNDRY DIVISION SMALL TOOL DEPARTMENT





# F.O.P.

by the Mullins *Koldflo*\* Process



This one-piece, 2 1/4" O. D. torsion tube used in tandem axles has a surface finish of better than 60 RMS both inside and outside, with concentricity held to .020 inches maximum. The inside offset at the open end of this tube is formed cold, to finished size, with no machining.

**M**ULLINS *Koldflo* steel extrusions are F.O.P. . . . *Finished On Presses* to a surface finish of 60 RMS or better. In case after case, these cold extrusions meet specified tolerances and surface requirements as produced, eliminating the finish machining or grinding required on parts produced by conventional methods.

Too, you can forget many of the design limitations of conventional methods when you design for *Koldflo*. We can produce precision cylinders with integral ends,

incorporating many details impractical with other methods . . . all in a one-piece design. Mullins *Koldflo* steel extrusions can be furnished in a variety of shapes and sizes and with a choice of mechanical properties.

If you require precision cylindrical steel parts in high volume, give us your specifications, and quantity required . . . We'll be glad to show you how *Koldflo* can turn your new designs into new and better products.



**"How Would You Tool-Up To Make An Egg?"**

For copy of new and expanded booklet, write Koldflo Division, Dept. A-5, Mullins Manufacturing Corporation, Warren, Ohio.

\*Trade Mark Reg. U. S. Pat. Off.

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NEW YORK  
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Phone: Diamond 1-1490

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# *Koldflo*


DIVISION

MULLINS MANUFACTURING  
CORPORATION

Warren, Ohio

Phone: 2-1166

May 12, 1955



# Let **KIRK** and **BLUM** bring your drawings to life

... on weldments and components

For 48 years, Kirk and Blum has been fabricating steel components for some of the nation's outstanding manufacturers ... and maintaining their confidence with substantial savings in time and cost. Whatever the nature of your fabrication, you can be sure that Kirk and Blum will exercise the same care you demand of your own organization.

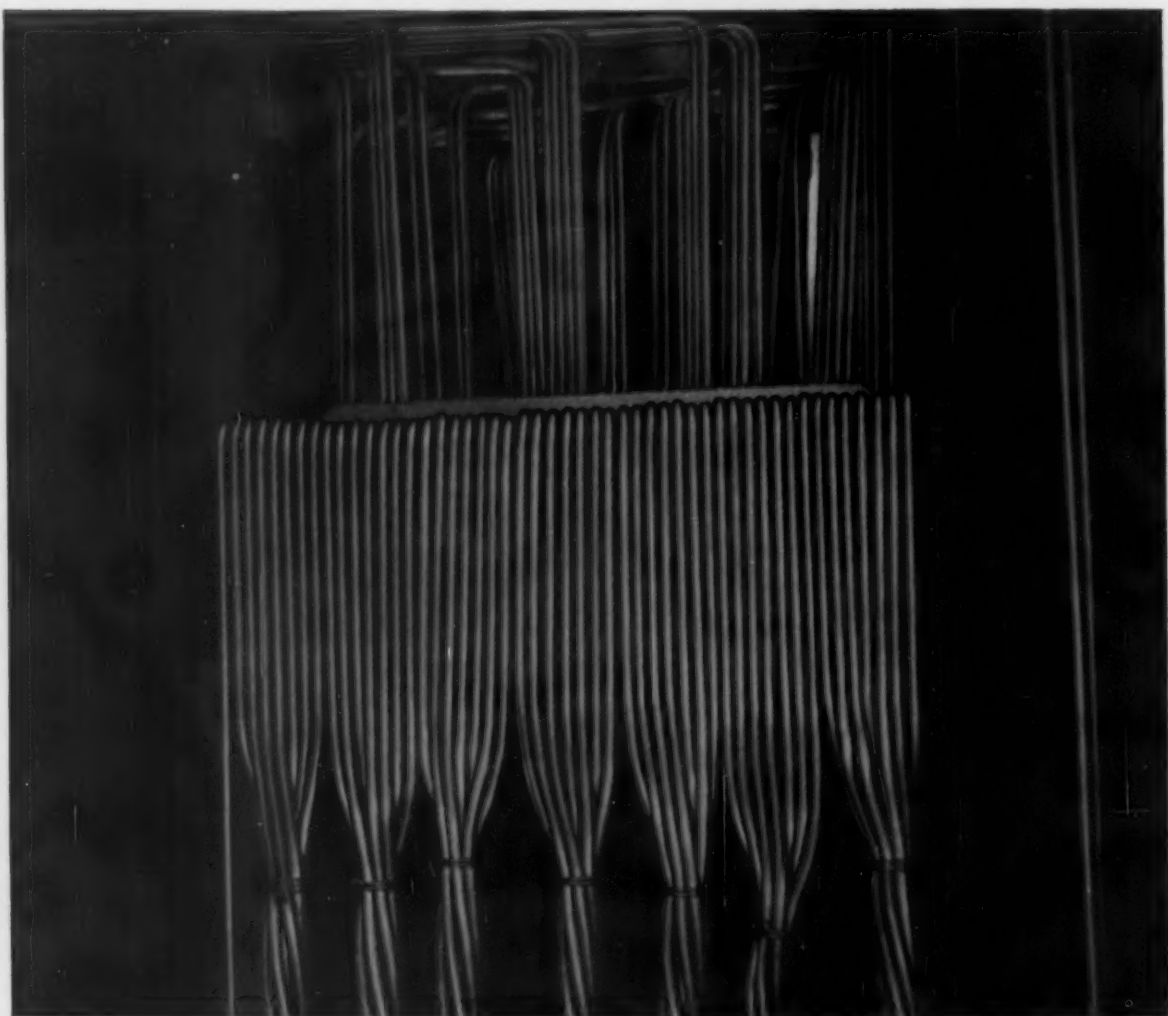
Kirk and Blum maintains complete facilities and special equipment for the fabrication of sheet metals and light structurals. Copper, aluminum, monel, stainless and other alloy fabrication is a Kirk and Blum specialty.

Let us send you detailed information on the products we have fabricated. Better yet, send us your prints for prompt quotation.

## **KIRK & BLUM**

**MANUFACTURING COMPANY**  
3200 FORRER ST.  
CINCINNATI 9, OHIO





Cabled copper instrument tubing installed at Appalachian Electric Power Company's Kanawha River Station. You see it at the point where the cable divides for run-outs to instruments. Note smooth, short-radius bends.

## 108,000 feet of cabled copper instrument-control tubing helps keep Kanawha River Power Station humming

Hundreds of air-actuated instruments are an important part of the instrumentation control network at the 430,000-kw Kanawha River Station of the Appalachian Electric Power Company — part of the American Gas and Electric System. The size of the plant called for instrument tubing runs of up to 1,000 feet — with tubing cabled in bundles. For economical stranding, the tubing was needed in unusual lengths — without joints. To conserve space, small diameter tubing was needed. And ability to take short-radius bends without pinching was necessary.

The 108,000 feet of Anaconda Seamless Copper Tubing was supplied in 1,000-foot lengths. Outside diameter was only  $\frac{1}{4}$ -inch, wall thickness only .030". Shown above are typical tube bundles

as they near terminal connections.

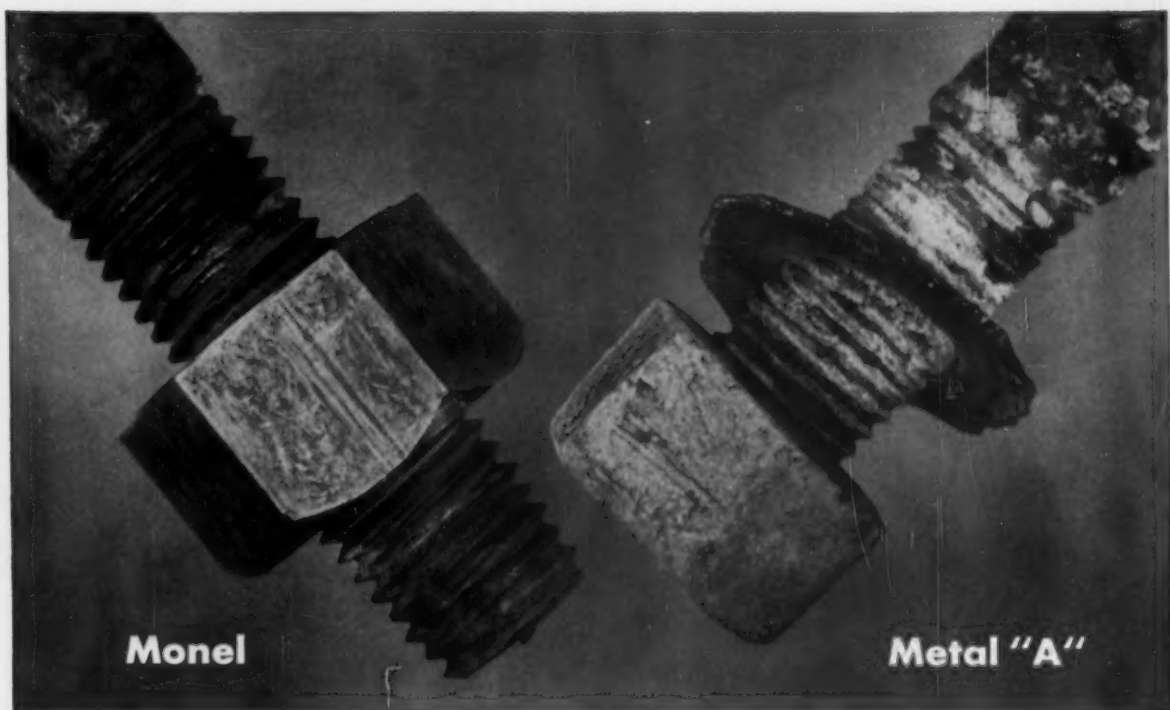
Anaconda small-bore, thin-wall tubing is available in lengths up to 2,400 feet. It comes in long coils on reels, or cut to your requirements. Capillary tubes, restrictor tubes, Bourdon tubes, special shapes, and fabricated tubes and parts for refrigeration and air-conditioning are available in many different alloys. These include phosphorized and OFHC copper, the full range of brasses, 3,003 aluminum, nickel silvers, and certain special alloys. For more information about Anaconda small-bore tubes and special shapes ask any district sales office, or write direct to *The American Brass Company, Waterbury 20, Connecticut*. In Canada: *Anaconda American Brass Ltd., New Toronto, Ontario*. 3078



Some of the many sizes and shapes of Anaconda Small-diameter Tubes.

**ANACONDA®**  
SMALL DIAMETER TUBES





Compare these "take-up" threads...

## You can tighten Monel pickling tank tie rods years longer

Look at the evidence . . . evidence you can duplicate.

The threads tell the story of Monel tie-rods' corrosion resistance. Monel does not dezincify and so the threads in front of the nut are as good as they look . . . all sound metal.

So when you need take-up thread, you have it, with Monel. You have it for many years.

Monel tie rods, users say, ordinarily outlast both the original wood tank and at least one replacement. One steel mill superintendent, for example, reports, "Monel tie rods gave us 19 years service on two old tanks . . . 22 years on two others." (The acid is 6-10% sulfuric at 180°F.)

**Tight tanks save acid** — Many users state that acid saving alone repays the first cost of Monel tie rods. They tell of other things they like, too . . . *Monel strength*, under tensions applied in tightening and by swelling timbers, *Monel toughness*, these rods take the wear and tear of pickling service in their stride.

### New booklet packed with equipment suggestions

See and read about many recent developments in Monel equipment for the pickle house. A spanking new 32-page Inco booklet, "Equipping the Pickle House for Greater Production at Lower Cost" gives illustrations and performance information. Tells how you can take advantage of Monel in designing your equipment. Write today.



THE INTERNATIONAL NICKEL COMPANY, INC.  
67 Wall Street New York 5, N. Y.



**Monel** . . . for pickling equipment



# Lamson ALUMINUM FASTENERS

## TO THE FASTENER BUYER:

Lamson & Sessions has manufactured Aluminum fasteners for the aircraft industry for many years. Therefore their experience with aluminum goes back a long ways. Now, however, Lamson has added to its aluminum line standard fasteners from stock.

- **FAST DELIVERY**
- **COMPETITIVELY PRICED**
- **FULL RANGE OF TYPES & SIZES**

*Here's good news for users of aluminum fasteners.*

Lamson & Sessions has now added "standard" bolts, nuts, screws and cotters of aluminum alloy to its famous full line of fasteners.

Henceforth the products illustrated above will be readily available. They come in a wide range of standard sizes, including machine screws down to No. 6 diameter by  $\frac{1}{4}$ " in length.

This means that users of aluminum bolts and nuts can now buy at competitive prices with the added advantages of fast delivery and service.

From now on it will pay you to insist on Lamson & Sessions aluminum fasteners — made by one of the world's largest fastener manufacturers.

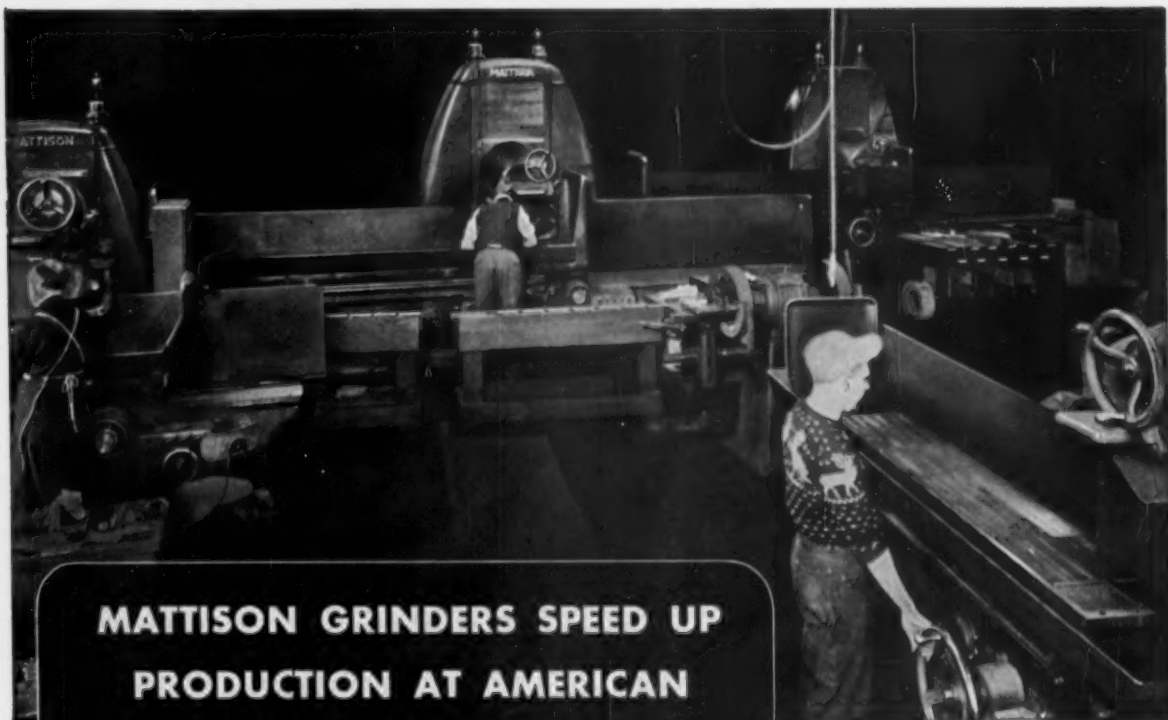


## THE LAMSON & SESSIONS CO.

1971 WEST 85th STREET • CLEVELAND 2, OHIO

Plants at: Cleveland and Kent, Ohio • Birmingham • Chicago

**LAMSON'S FASTENER EXPERIENCE IS  
NOW YOURS IN ALUMINUM**



**MATTISON GRINDERS SPEED UP  
PRODUCTION AT AMERICAN  
SAW & MFG. COMPANY**



● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

**MATTISON**

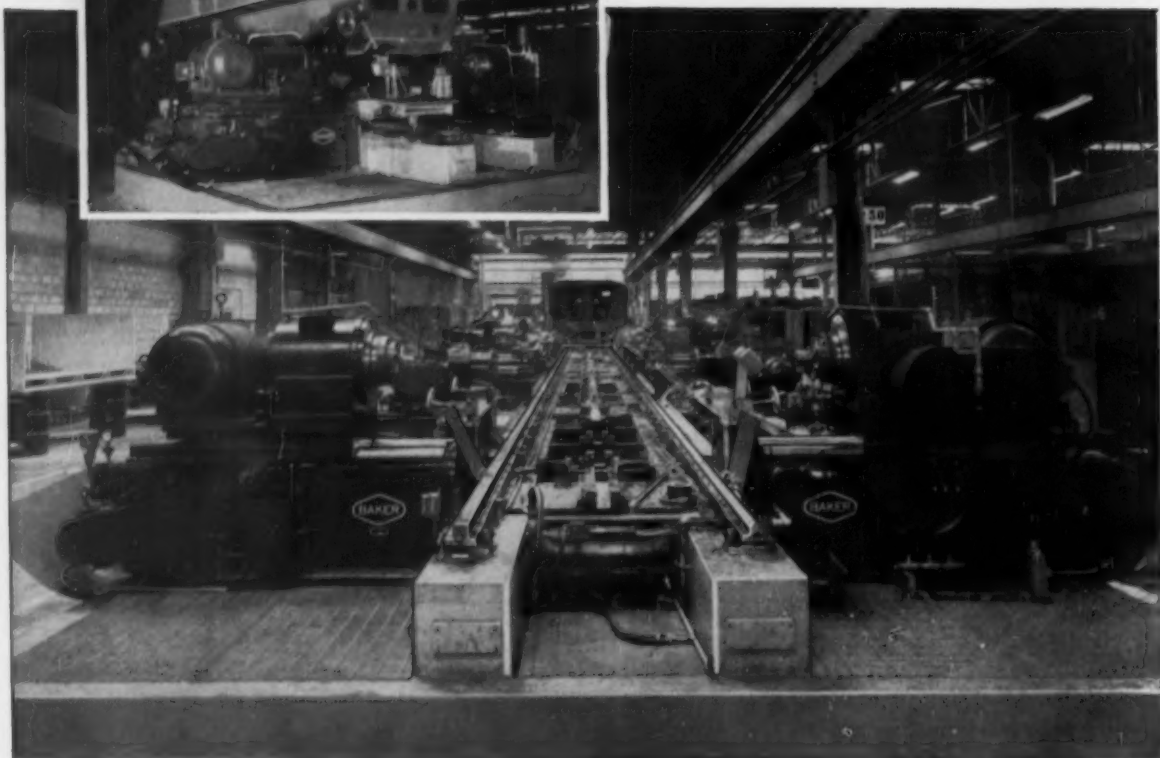
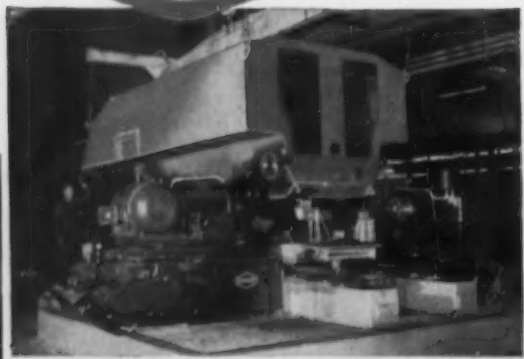
ROCKFORD • ILLINOIS

**MACHINE WORKS**



MACHINES

15,000 lb. TANK HULL  
as it passes along  
100 FOOT RAILS!



**OPERATIONS: DRILLING . . . TAPPING . . . BORING . . . FACING on 102 holes . . . plus 10 main bores.** Mounted on a specially-built floating concrete slab, this huge new Automatic Baker Transfer Machine accurately performs multiple drilling, tapping, boring and facing operations on

15,000 pound rough weldments 9 feet wide and 16 feet long. Savings achieved in production costs with a machine of this type are tremendous. Baker engineering know-how stands ready to solve your production problems . . . with cost cutting standard or special, single or multi-operation machines.

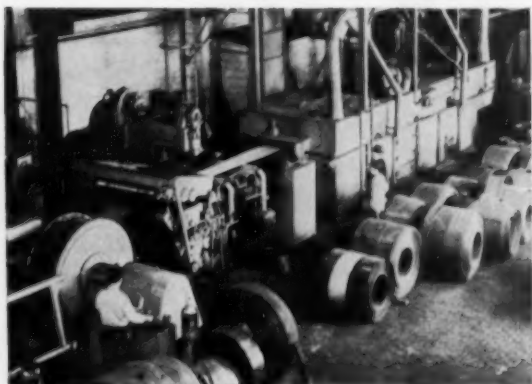
Write regarding your specific job problems . . .

**BAKER BROTHERS, INC. Toledo, Ohio**  
DRILLING...TAPPING...KEYSEATING and CONTOUR GRINDING MACHINES



## In Steel Mill Processing

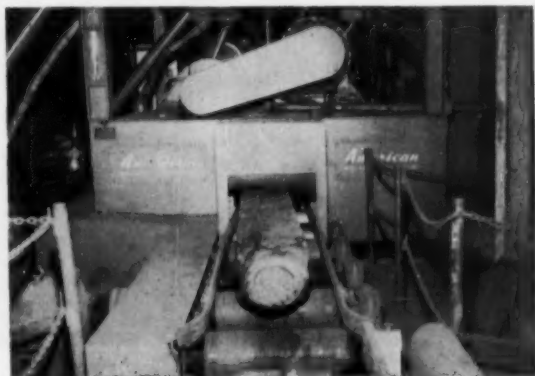
# WHEELABRATOR® CLEANING SAVES MONEY EVERY TIME



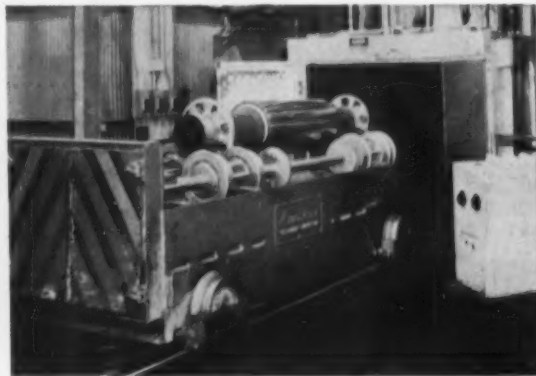
Descaling Strip at Allegheny Ludlum Steel Corp.



Descaling Sheet at Rheem Manufacturing Co.



Descaling Slabs, Billets at Atlas Steel, Ltd.



Etching Mill Rolls at U.S. Steel's Fairless Works

Mechanical descaling with the airless Wheelabrator as an integral unit in steel cleaning lines offers impressive savings in lower production costs for steel producers and fabricators alike.

In descaling steel sheet or strip or etching mill rolls, Wheelabrator's controlled abrasive blast cuts costs in many ways: reduces or eliminates acid pickling; slashes labor costs, crane service and space re-

quirements; improves product quality; adds to equipment life.

More than 60 Wheelabrator installations now descale slabs and billets, continuous carbon strip, sheet steel, bar stock, wire rod and structural steel shapes. They also condition ingot molds and etch mill rolls.

These achievements demonstrate Wheelabrator's leadership and ten years' experience in this field.

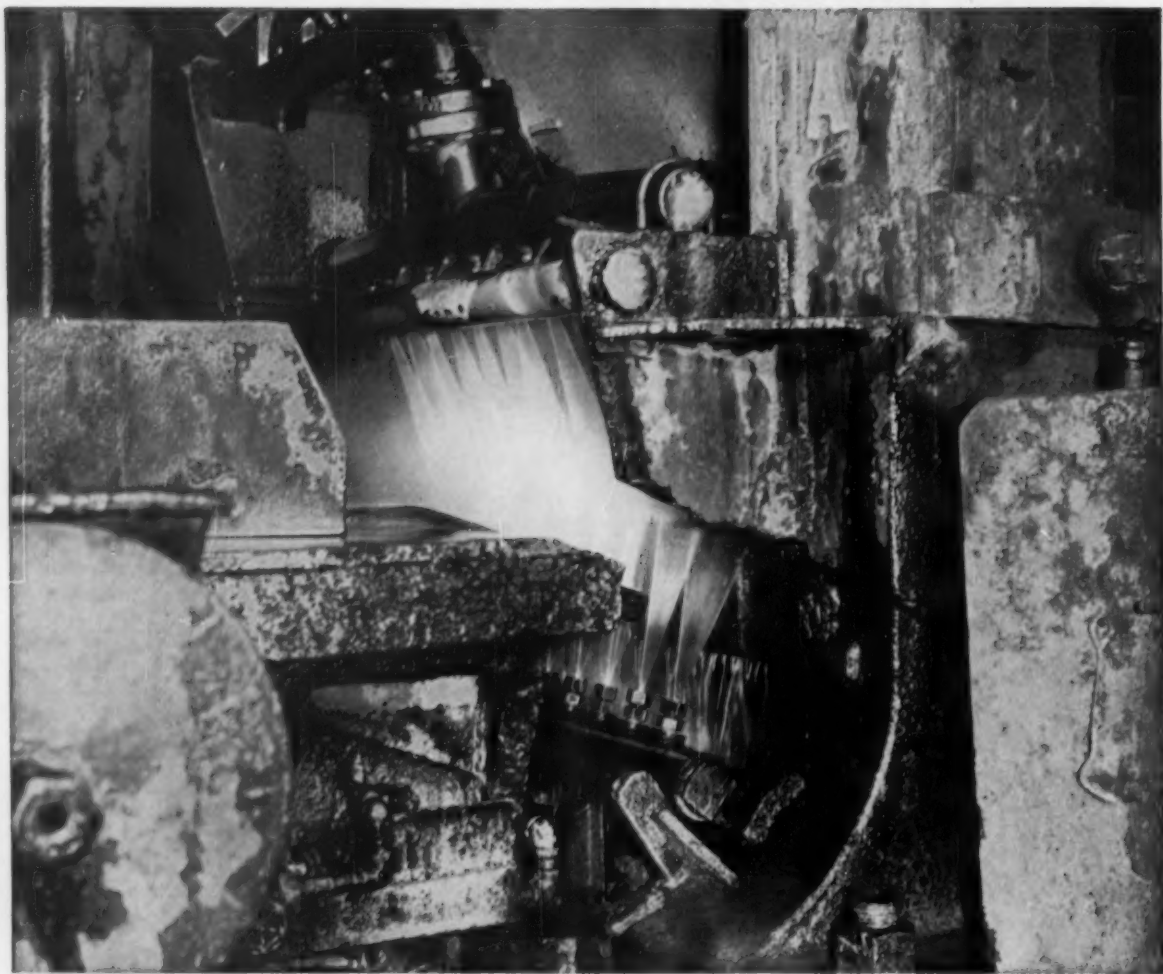
Write today for complete information on a Wheelabrator machine for your descaling requirements. Ask, too, for a test demonstration on your own products in our fully equipped laboratory or ask for the name of a plant where you can see the Wheelabrator in operation.

Write today for this fact-packed Bulletin, No. 864.



AMERICAN WHEELABRATOR & EQUIPMENT CORP., 510 S. Byrkit St., Mishawaka, Indiana

May 12, 1955



## HOT STRIP DESCALING

Thin jets of water strike with tremendous force against sheets of steel. Harmful scale is dislodged, broken up, carried away. The steel passes on—and its producer is assured of higher quality, more accurate gauge and better surface finish.

Such is the story every day, in one steel plant after another, wherever an *Aldrich Descaling System* is on the job.

In these plants Aldrich Direct Flow Pumps and Spray Nozzles, tied together in hard-hitting teams, do their

jobs quickly and efficiently. The pumps build up high water pressures to nozzles, which, in turn, are designed to produce knife-edged lines of water with an impinging force equal to 95% of the potential energy supplied to the nozzle orifices. This powerful action breaks the scale in a fraction of a second; the deflected stream of water washes away the loose scale.

The jet action and striking force developed by Aldrich Patented Spray

Nozzles give far more effective descaling than nozzles which produce jets of equal force but with larger impinging area . . . a claim proven in hot strip as well as billet descaling! High efficiency of cutting spray force results in thorough descaling *without* excessive cooling due to overabundant use of water.

There's an Aldrich Descaling System—or Pumps or Spray Nozzles—to meet *your* particular needs. Write us today for complete information.

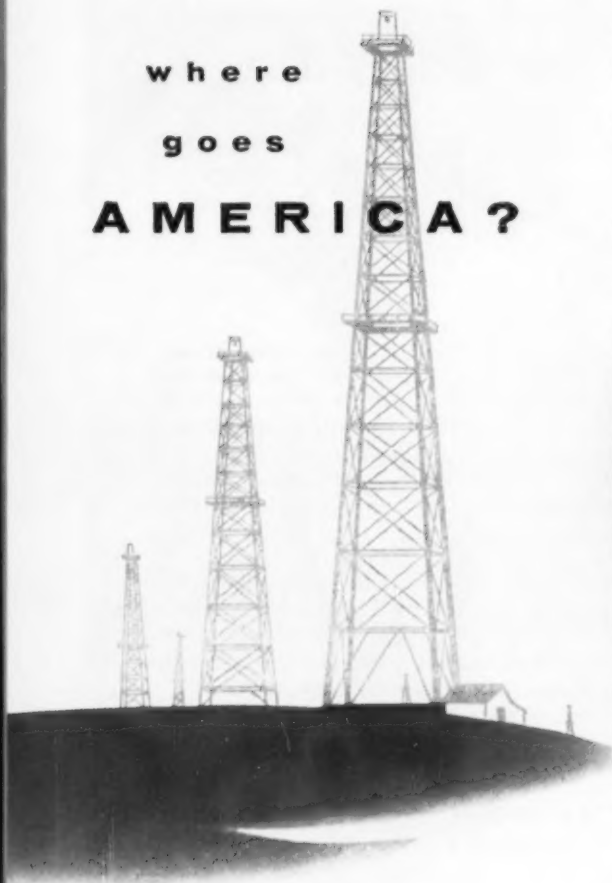
**The Aldrich Pump Company**

8 PINE STREET • ALLENTOWN, PENNSYLVANIA

*Representatives in Principal Cities*



where  
goes  
**AMERICA?**



★ America goes after more and more oil and gas as demands increase . . . up about 5% in 1955. More wells will be drilled, an estimated 54,500. The average depth goes deeper, now down better than 4,000 feet. More and more pipe lines must be built . . . some 14,704 miles planned, approved or authorized. Every year more and more steel is required for production, processing and pipeline transportation per barrel of cubic foot of oil and gas.

All of this activity means more and more oil country goods and much of it will be seamless pipe and tubing.

Are your pipe and tube mills modernized or are you losing out competitively on quality or production?



Most of the ideas about making seamless tubing have been worked out between the steel industry and Aetna-Standard in 54 years association. Many new ideas are available from Aetna-Standard to make your pipe mills more productive. Or, if you are considering new facilities, Aetna has the facts on which to base an intelligent decision.

**SUBSIDIARY and ASSOCIATED COMPANIES**

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.  
Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.  
M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.  
Societe de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.  
Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.  
Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.  
Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.  
Hals & Ruligren, Inc., Akron, Ohio — Representative for the Rubber Industry.  
Standard Engineering Company, Ellwood City, Pa.  
Trans-World Traders, Pittsburgh, Pa.

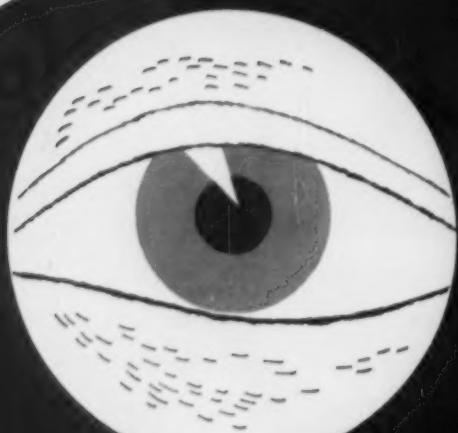
*Designers and Builders to the Ferrous,  
Non-Ferrous, Leather, Rubber, and Plastic Industries*

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

**Aetna-Standard**

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

**GOOD EQUIPMENT BRINGS DOWN  
PRODUCTION COSTS**



# THE MACHINE TOOL SHOW

INTERNATIONAL  
AMPHITHEATRE  
CHICAGO, ILL.

September 6-17, 1955

17,763\* manufacturing

V.I.P.S on the lookout  
for better Production!

No need to squint through a keyhole, though. It's no secret that the latest, the fastest, the most ingenious in cost-cutting metalworking methods will be unveiled at the Machine Tool Show, in Chicago, in September.

More than ninety per cent of the country's leading machine tool builders will be on hand; it's the largest and most important show of its kind, the first since 1947.

Plan now to attend; you can't afford to miss it. And here's an added reason—you can see the latest in machine tool accessories at no additional cost. Your Machine Tool Show badge will admit you to the Production Engineering Show, on the Navy Pier, on the same dates.

Bring your key production people with you; share with them this unequalled opportunity to see the latest developments in machine tools. The 1955 Machine Tool Show is the best chance you've ever had to see the world's best investment—in action!

NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION

2071 East 102 Street • Cleveland 6, Ohio

THE  
MACHINE TOOL  
SHOW

CHICAGO, ILL.

SEPT. 6-17, 1955

INTERNATIONAL AMPHITHEATRE



\* Estimated Attendance, Before Receiving Your Reservation



# Where can you use this simple fastener?

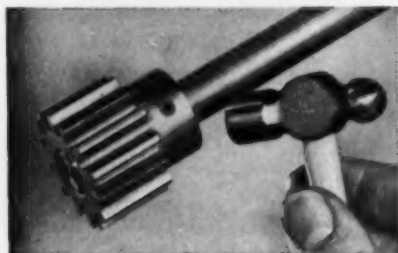


No threading, peening or precision  
drilling with ROLLPIN

Rollpin is driven into holes  
drilled to normal production-  
line tolerances.



It compresses as driven.



Rollpin fits flush . . . is vibration-proof.

Rollpin is the slotted tubular steel pin with chamfered ends that is  
cutting production and maintenance costs in every class of industry.

This modern fastener drives easily into standard holes, com-  
pressing as driven. Its spring action locks it in place—regardless of  
impact loading, stress reversals or severe vibration. Rollpin is  
readily removable and can be re-used in the same hole.

\* \* \*

*If you use locating dowels, hinge pins, rivets, set screws—or  
straight, knurled, tapered or cotter type pins—Rollpin can cut  
your costs. Mail our coupon for design information.*



as a rivet

## ROLLPIN

TRADE MARK



a hinge pin



a dowel



a set screw

Dept. R16-577, Elastic Stop Nut Corporation of America  
2330 Vauxhall Road, Union, New Jersey

Please send me the following free fastening information:

☐ Rollpin bulletin

☐ Here is a drawing of our  
product. What fastener  
would you suggest?

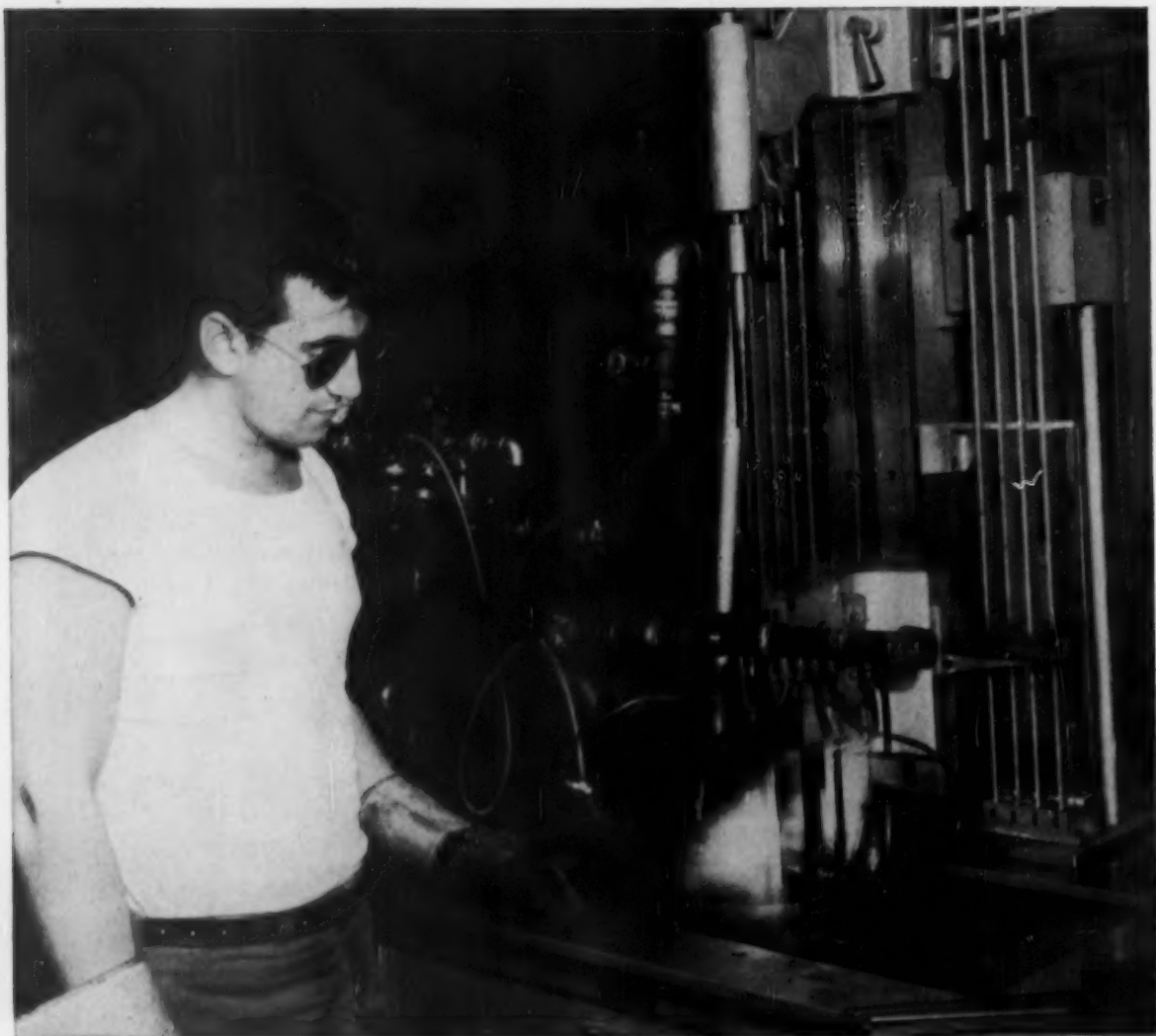
☐ Elastic Stop Nut bulletin

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



## ***GAS-*** an adaptable tool for L R Heat Treating Co.

This is one of the many applications of Gas for special heat treating problems at L R Heat Treating Co., Newark, New Jersey. In this case, metal to be heat treated is held stationary while Gas burners move vertically along the length of the work. Sprays of water just below the flame area do the quenching.

Gas is the fuel used for heat treating at this modern plant. When asked to give their reasons for preferring Gas for heat treating, the staff at L R Heat Treating selected the following points as most important:

1. Very clean
2. Easy to control
3. Better combustion
4. Less equipment maintenance
5. No messy leaking connections
6. Easier to start up after shut-down
7. Dependable fuel supply
8. Excellent technical service supplied by the local utility

For further information on how Gas can help you in your heat treating operations, call your Gas Company Industrial Specialist. He'll be glad to discuss the economies and results Gas and modern Gas-fired industrial equipment can provide. *American Gas Association.*

## GA&F Carbonyl Iron Powders

These are spherical iron powders—as shown in the surrounding photomicrograph. Diameters run from 3 to 20 microns; in some types the iron content is as high as 99.6% to 99.9% . . . New types have recently been developed; there are today a total of 10—which may be classified as shown in this table.

FIRMNESS PARTICLE SIZE RANGE	SOFT (EASILY COMPRESSIBLE TO HIGH DENSITIES)		HARD (PRESERVE SPHERICAL SHAPE UNDER PRESSURE)	
	"NORMAL"	SPECIAL FOR HIGH Q	"NORMAL"	SPECIAL FOR HIGH Q
COARSE	L	GQ-4	E	J
MEDIUM	HP	GS-6	TH	—
FINE	C	—	SF	W

\*C HAS MEDIUM PARTICLE SIZE RANGE, BUT IS HARDER THAN HP.

Let us send you a 32-page book giving characteristics and applications . . . We invite you to call upon our research facilities and Technical Service Department for assistance in developing new applications or new products involving the use of any of these powders. We also invite inquiries for powders whose performance characteristics are different from those exhibited by any of our existing types . . . Kindly address Department 34.

*From Research to Reality...*

**ANTARA**

**ANTARA. CHEMICALS**



A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14, N. Y.

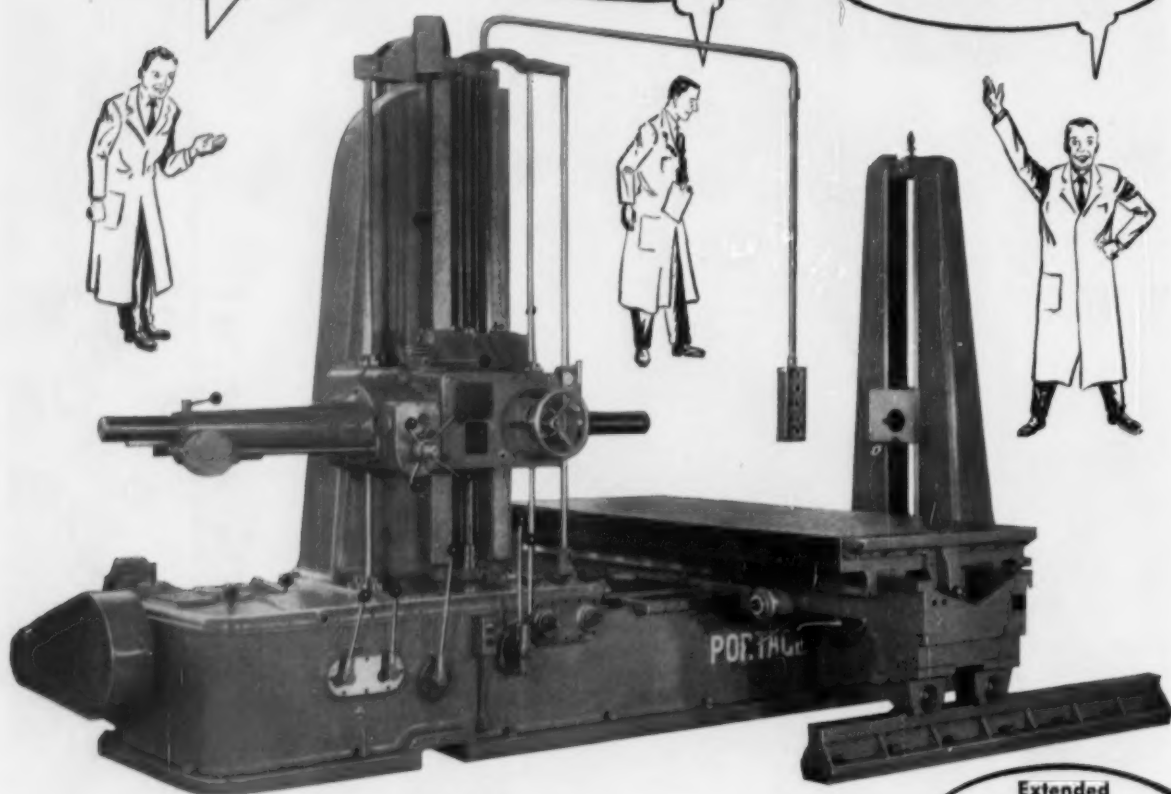


# CHECK THESE *Features...*

4" spindle diameter,  
precision machined  
nitralloy steel.

Pendent controls include  
spindle rotation, forward, re-  
verse, jog forward, jog reverse  
and stop.

36 spindle speeds  
8-1000 R.P.M. 18 Feeds.



Unusually wide and  
deep base, cast entirely in  
one piece . . . offers  
excellent rigidity.

Extended  
table saddle with  
adjustable supports  
and runways makes  
it possible to handle  
the big jobs, too!

**PORTAGE MACHINE PRICES START AT \$31,358 COMPLETE.** The PORTAGE Horizontal Boring, Drilling and Milling Machine is a precision built tool. Only the finest of materials and workmanship go into its manufacture . . . and at a comparatively lower cost. Get ALL the facts . . . write for literature and specifications . . . TODAY.

**PORTAGE**

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BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916







## HOW **Brainard** ELECTRO-GALVANIZED STEEL

★  
*Improves product life and appearance*

★  
*Protects against rust and corrosion*

★  
*Eliminates plating and finishing*



Find out how Brainard's new facilities assure you a dependable source of supply. Send coupon for free booklet.



**COMPLETE STRAPPING SYSTEMS & MATERIALS  
WELDED STEEL TUBING • ELECTRO-GALVANIZED STEEL  
SCAFFOLDING • PALLET RACKS • BUILDING PRODUCTS**

*Offices in principal cities throughout the U.S.*

● For lower production costs, greater product quality, specify Brainard Electro-Galvanized Steel. Its built-in zinc finish protects both inside and outside of formed and drawn parts . . . permits fabrication by any standard method, without damaging the coating.

This new, easy-to-read booklet provides full details—covers fabrication, quality control, range of sizes, nationwide technical assistance. Find out how you can obtain better product quality at less cost. Send coupon today for your free copy.

**BRAINARD STEEL DIVISION**  
Dept. O-5, Griswold Street, Warren, Ohio

Please send free descriptive booklet on Brainard Electro-Galvanized steel.

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Position   
Company   
Street   
City  State

# “DEEPER DRAWS at LOWER COST with our H·P·M”



*“We are very pleased with our H-P-M. For years we felt we could do as well as anyone on depth and severity of draw but H-P-M has certainly broadened our scope in this respect—and at lower costs.”*

Mr. Ralph F. Mueller  
Exec. Vice President  
General Metal Products Co.



## General Metal Products Reports Broadened Scope and Lower Costs with 700-ton H P M Hydraulic.

Take a tip from one of the midwest's largest metalworking specialists — H-P-M's will reduce costs for you, too. Whether it's drawing, forming, embossing, forging or other operations — large or small, deep or shallow, complex or simple — there's an H-P-M for the job. You'll find more and more work for

your H-P-M with its fast cycle, all-hydraulic, automatic control and ease of die set-up. If obsolete equipment is hampering your production, call in the H-P-M field engineer for a close look at the most modern press equipment available. Broaden your scope with faster, more versatile H-P-M's.

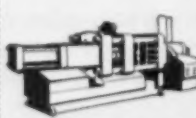
*Write today for Bulletin 5005.*



METAL WORKING PRESSES



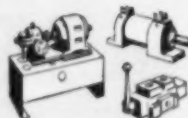
PLASTICS MACHINES



DIE CASTING MACHINES



C—PRESSES



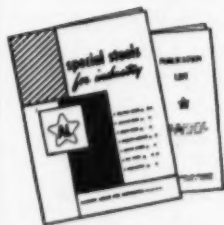
POWER EQUIPMENT

### THE HYDRAULIC PRESS MFG. COMPANY

1006 Marion Road, Mount Gilead, Ohio, U. S. A.



## **FIRST COST** can be the **LEAST COST** if it's the **LAST COST**



### **WRITE TODAY**

#### **For These Publications**

**1. SPECIAL STEELS FOR INDUSTRY** . . . 16 pages of essential data on the proper selection and application of principal AL special alloy products: stainless, tool and electrical steels and sintered carbides.

**2. PUBLICATION LIST** . . . a complete listing of all AL publications, both technical and non-technical (over 100 in all), with a handy order form for your convenience.

ADDRESS DEPT. A-65

First cost is never the whole story. Length of service and cost of upkeep are equally powerful factors in determining the life-time cost . . . the *real* cost of an object.

Nor does it have to be something glamorous. Even such everyday things as kitchen garbage containers and work surfaces, mixing bowls and flour sifters, etc., are transformed when they're made of Allegheny Metal. They look better, clean easier, last many times longer. That's because *no other metal* is at once as hard and strong, as

resistant to wear and corrosion, as stainless steel. Even where the use of Allegheny Metal results in higher first cost (and quite often it doesn't!) it is sure to cost far less in the long run.

Does that give *you* ideas about adding new sales appeal to your product? Or reducing maintenance, repair and depreciation costs in your equipment? If so, our engineers are ready to help you work them out. *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.*

Make it **BETTER**-and **LONGER LASTING**-with

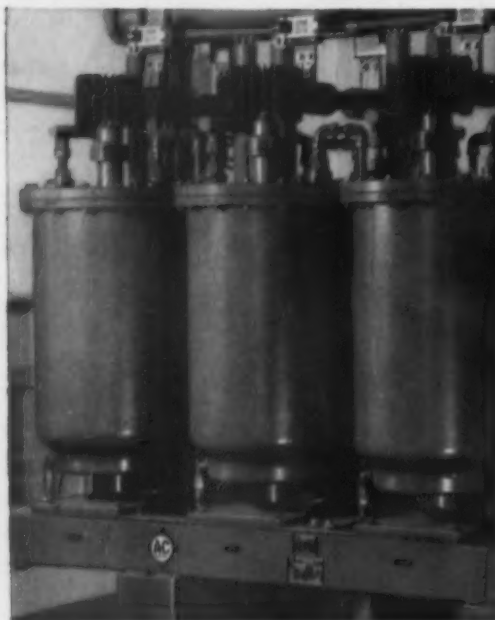
# **Allegheny Metal**

WAS 5399C

Warehouse stocks carried by all Ryerson steel plants

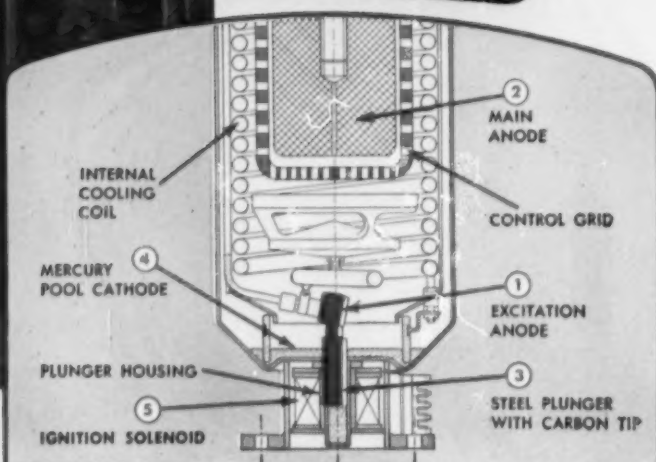


# Here's the Rectifier That Needs No Delicate Adjustments



This 1000-kw, 6-tube excitron rectifier is typical of units used for heavy-duty service in many industrial plants.

## ALLIS-CHALMERS Mercury Arc Rectifiers



### Unique Plunger Starts Continuous Excitation

The excitron tube has an excitation anode<sup>①</sup> in addition to the main anode<sup>②</sup>. With the excitation circuit de-energized, the steel plunger<sup>③</sup> floating in the mercury pool cathode<sup>④</sup> makes positive contact with the excitation anode (as shown).

When the excitation circuit is energized, the ignition solenoid<sup>⑤</sup> pulls the steel plunger<sup>③</sup> away from the excitation anode<sup>①</sup> and under the mercury pool cathode<sup>④</sup>, thus drawing a dc arc and forming the cathode spot, which makes conduction of load current by the tube possible.

If power is interrupted the plunger will float up, contact the excitation anode and automatically re-establish the excitation arc when power is restored.

**L**ITTLE MAINTENANCE IS NEEDED with Allis-Chalmers excitron-type rectifiers. Excitation of the excitron rectifier is continuous, while other types of rectifiers require re-ignition 60 times a second.

Since it is more difficult to start a rectifier arc than to maintain it, the excitron rectifier is much less likely to lose excitation during operation. Momentary dips in supply voltage which are encountered in many supply systems have no effect on the continuous excitation arc.

Years of operation in hundreds of installations have proved the reliability and ease of operation of Allis-Chalmers mercury arc rectifiers. You can get complete information from your nearby A-C office. Or write Allis-Chalmers, Milwaukee 1, Wis.

A-4581

# ALLIS-CHALMERS





## The Iron Age Newsfront

## Automation Interest Continues Strong

Despite controversy over automation, large industrial users continue to take advantage of new technological advances. Automatic handling features are being built into latest metalworking equipment wherever the opportunity to cut costs or improve quality can be demonstrated. Many medium size shops are increasingly interested in automatic loading and unloading of parts.

### Boom Note: Rivets Do Job Faster

There's so much steel construction going up on the East Coast that one New York builder has imported Indian steelworkers from the Montreal area. Another solution: Switch to bolting instead of riveting as another New York builder recently did.

## Transistor Machine Control Developed

An all-transistor machine tool control is now in final development stages. New unit has no vacuum tubes, no moving parts, takes less space than other types and cannot stick shut. Experimental models have shown up well in field trials.

## Canada May Seek New LP Gas Markets

With petroleum activity generally strong in Canada, liquefied petroleum gas production continues to outstrip domestic consumption. Forecast: Canadian liquefied petroleum products will be seeking new markets in the U. S. or abroad in the near future.

## New Steel Expansion Round In View

A new round of steel ingot expansion probably will get underway sooner than expected. Industry leaders are frankly flabbergasted that steel demand, almost wholly civilian, is pushing mills to capacity operations. New capacity plans already are in the works. Those underway will be expanded.

### Farm Income: How Good Was 1954?

There's been a lot of talk about how badly farm income fell off in '54. But if farm inventories (actually unrealized earnings) and the 3.5 pct drop in the farm population are taken into account, per capita farm income was actually higher last year than in 1953.

## Ultrasonics Aid Steel Extrusion

Use of ultrasonic waves to facilitate movement of plastic steel through extrusion dies is now in the experimental stage. This new method may open the door for many new hot-extruded shapes which at present are only possible through rolling or machining. In addition, die life is lengthened, it is reported.

### See Rise In Butane-Propane Use, Output

A sharp increase (20 pct) in butane-propane consumption is expected in the U. S. over the next two years. Ethylene production alone is expected to boost its propane consumption by 250,000,000 gal per year in that time.

## Investment Casters Want Test Standard

Development and adoption of a standard test bar for investment castings has been proposed by the Investment Casting Institute. When specimen is developed intention is to coordinate adoption with ASTM. Casting consumers and producers are cooperating in the venture.

## More Management Development—By 24 Pct

More companies are using management development programs, a recent survey by the American Management Assn. indicates. Some 54 pct of firms queried—up 24 pct from 1952—said personnel development is now on a planned basis.

## Delivery: Truck Shortage Chokes Steel

Contributing to the problems of steel consumers in a tight market, is a shortage of trucks for delivery and transportation of finished steel products. Holdups and costly delays because of non-availability of trucks are becoming more frequent, particularly in the Midwest.



**TOPS  
...IN  
COLD FINISHED  
CARBON  
STEEL BARS**

# "J&L 1200"

"J&L 1200" Steel provides the qualities that help machine operators do top-flight work at lower overall costs. With "J&L 1200," the operator obtains: better machine finishes... longer tool life... higher rates of speed. This fact has been proven time and again—in shop after shop.

"J&L 1200" grades meet the compositions published by the A.I.S.I., S.A.E., and Federal Specifications QQ5-633.

Try this steel in your own shop. Results will convince you "J&L 1200" deserves to be a regular specification for your production runs.

Use "J&L 1200" steel on your tough jobs for...

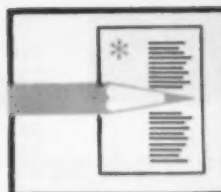
tops in quality      tops in uniformity

tops in machinability      tops in finish

available in all standard shapes and sizes

**J&L  
STEEL**

*Jones & Laughlin*  
STEEL CORPORATION - Pittsburgh



## Scrap Slump Contradicts Ingot Rate

**Priced down in all markets despite high steel production . . . Auto list scrap gets most of blame . . . Home scrap, blast furnace production are up, cutting demand . . . Strong export markets prevents big drop.**

♦ IS THAT USUALLY reliable barometer of the steel industry, the scrap market, out of adjustment?

While the ingot rate is hovering near maximum capacity and weekly steel production has set a new all-time record, the scrap market has fallen in the major steel-making areas from \$1 to \$4 in the past month.

Scrap men are actually seeking new uses of scrap, primarily bundles, which would give them added market leverage aside from pres-

ent steel mills and foundries. They feel that something must be wrong if the market is sliding at a time when all economic factors point to a rising price structure.

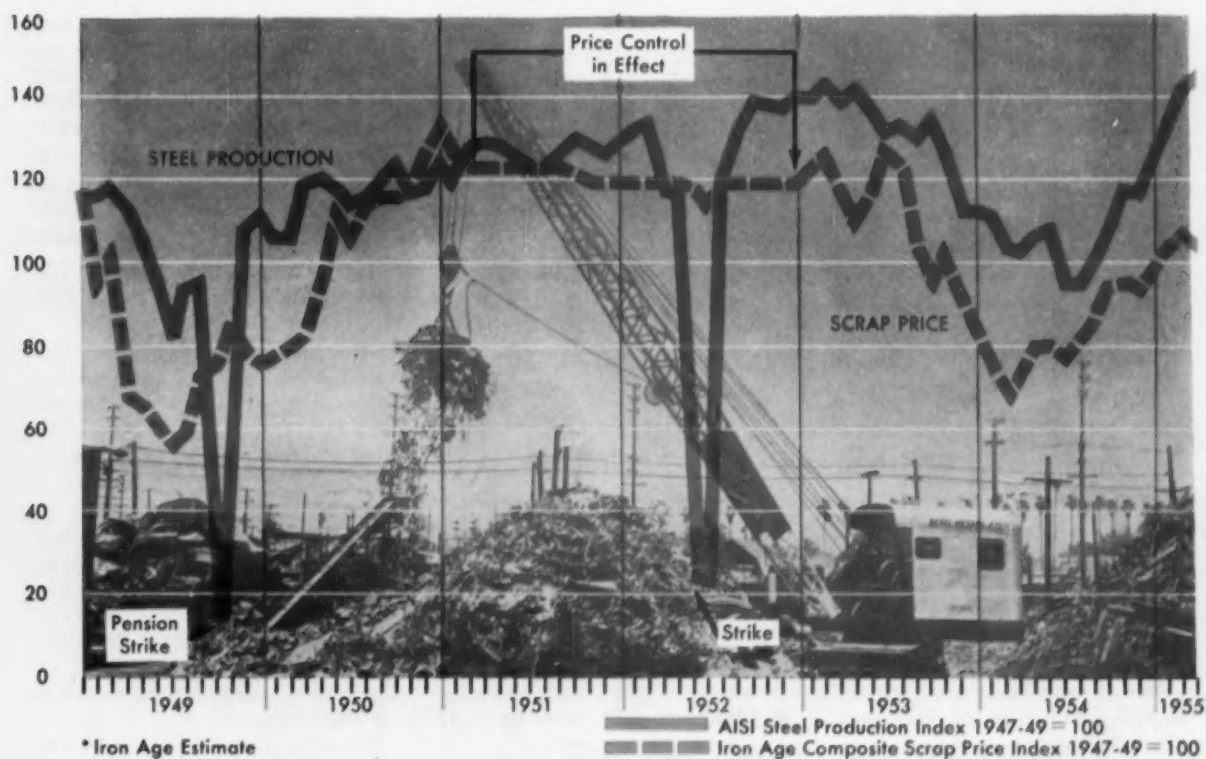
But closer evaluation of the scrap picture shows that the forces that depressed the market are in many cases factors that indicate a continued strong steel market as well as reflecting the upward surge of steel production of past months.

For one thing, mills made a concerted effort to keep the market

from running away. Only a few weeks ago, an effort was made to control scrap exports which threatened to push scrap prices out of sight on the East Coast.

As a result, the export market remains under close scrutiny. Under existing rules, an exporter holding outstanding licenses may apply for additional licenses on a cargo-for-cargo basis against shipments made between Feb. 21 and Mar. 7. An exporter without a license may apply to export a quantity not to exceed a maximum

### Do Scrap Prices Forecast Steel Production?



cargo lot on a single carrier.

But the basic reasons for the slump in scrap prices are much closer to the mill.

First, when scrap prices approached \$40 for No. 1 grades, mills brought the full force of their expanded blast furnace capacity to bear. With abundant ore stocks assured with the opening of the shipping season, it is cheaper to charge mills with hot metal.

#### Big Auto Lists

A major Midwestern broker estimates that mills in his area are utilizing 50 pct hot metal in open-hearth charges.

But main reason for falling prices is the booming auto industry, which is turning out huge tonnages of prime, fresh bundles at a rate comparable with the record output of cars.

Mills are overloaded with No. 1 bundles, with inventories extended as far as 90-100 days in most areas. The high quality of industrial bundles further depresses the dealer price and widens the gap between No. 1 and No. 2 grades.

Scrap men estimate that generation of automotive scrap is running 50 pct over a year ago. Representative lists of automotive scrap offered for this month bear out this estimate.

The giant Fisher Body Div. of General Motors expects to make 72,100 tons of No. 1 bundles this month compared with 54,300 in 1954. Chevrolet gear and axle plant in Detroit will sell 5000 tons

of punchings and plate scrap compared with 1000 tons a year ago. Chrysler will generate 17,000 tons of No. 1 bundles this May compared with 6900 tons a year ago.

#### More Home Scrap

Automotive list prices slumped over \$2 a ton this month as inventory laden mills shield away from more tonnage.

Auto industry is responsible for the scrap price decline on another score. The amount of home scrap generated by the mills has increased substantially because of the emphasis on flat-rolled products for auto plants. To produce sheets for cold-rolling, ingots are cropped closer and trimming and edging percentage increases.

It is estimated that home scrap now runs to 25 pct of an open-hearth heat, added to the 50 pct hot metal charge, that leaves only 25 pct from outside scrap.

An authoritative source reveals that nationally scrap consumption per month is running from 2.6 to 2.7 million tons per month compared to a normal 3 million tons at the present rate of operations.

As a result, mills are at their most comfortable position — good stocks of ore and scrap and a booming market for their products.

Actually, scrap prices are not low in spite of the drop in the past few months. THE IRON AGE Composite price of No. 1 heavy melting at \$35 last week was still well above the level of \$27.25 a year ago.

#### Inventories High

Furthermore, the price is not apt to sag to abnormally low levels, particularly in the East where the

export demand is still strong.

A district-by-district check shows that mill inventories are more than comfortable, probably longer in most cases than is ideal.

In Pittsburgh, estimates are from 75 to 90 days, with a major consumer believed to be below average. This could keep prices here from dropping sharply.

In Cleveland, inventories are from 2½ to 3½ months with heavy tonnage of blast furnace grades moving down the Lakes from Detroit docks where they accumulated during the winter months.

Valley mills have even higher stockpiles with a minimum of 4 months at larger mills. Smaller mills are holding 60-90 day supplies.

Detroit mills have inventories estimated at up to 100 days, with further easing probable in this scrap surplus area.

Chicago mills have over 60 days supply and some shipments of dealer scrap and even industrial have been turned down recently.

Some markets imply the price structure may be even softer than indicated with No. 1 grades occasionally downgraded and sold at No. 2 prices.

Slumping prices have been universal in all major markets. In one month, these drops were registered in the following markets: Pittsburgh, down \$3; Chicago, \$3; Philadelphia, \$1; Detroit \$2; Cleveland, \$3.50.

#### No Scrap for Reds

Scrap exported from the U. S. is not finding its way behind the Iron Curtain.

Government security regulations and economics of the world market make it practically impossible for any U. S. scrap to find its way to Red countries, according to the Institute of Scrap Iron & Steel.

"All applications for export licenses to destinations other than the western hemisphere must be accompanied by certified documentary evidence that the material will not be trans-shipped from the country of destination," said E. C. Barringer, executive vice-president of the Institute.

Testimony to that effect was

## Here's Why Scrap Prices Are Slumping:

- There has been nearly a 50 pct increase in output of prime automotive scrap.
- Increase in mill home scrap because of emphasis on flat-rolled products.
- Full utilization of increased blast furnace capacity which re-

duces scrap consumption.

- Extended mill scrap inventories and abundant ore stocks.

- Partial control of scrap exports with stricter measures a threat.

- Stubborn mill resistance to avoid a runaway market.



made in answer to a request from Sen. Olin Johnston, South Carolina Democrat.

It was pointed out that the six Schuman plan countries, which take about 40 pct of all American scrap exported, pool their purchases, as does the United Kingdom. It is unlikely that any of these countries, all of which need scrap themselves, would release it to other nations.

Exports of scrap to Japan account for about 20 pct of all American exports. It is just as unlikely that there would be any trade between Japan and Red countries.

### Curb Lithium Exports

Government controls on export of lithium to all foreign countries except Canada were tightened, effective April 28, as a national security measure.

Added to the U. S. Bureau of Foreign Commerce positive list of commodities are lithium alloys (schedule B no. 664998), ores and concentrates (B no. 664598), and lithium-containing minerals (B no. 596098).

Companies intending to ship these three commodities out of the country will need export licenses validated by the bureau.

### Selenium Export Date

Filing dates for applications to export selenium and selenium chemicals run from June 1 to 15 for the third quarter of the year, the Commerce Department's Bureau of Foreign Commerce announces.



## INTERNATIONAL

# STEEL: Norway Integrates

**First integrated mill in production . . . Near Arctic Circle, mill uses electricity for pig iron production . . . New city rises at mill site . . . Will cut steel imports.**

♦ **WITHIN** a few miles of the Arctic Circle, Norway's first integrated steel mill is nearing completion.

The mill at Mo-i-Rana is scheduled to produce 170,000 tons of rolled products annually. Plans call for eventual expansion to 240,000 tons per year compared to Norway's present import rate of 450,000 tons annually.

Norsk Jernverk A/S is the state-owned operating company. It is organized as a limited liability company, with board, chairman, and managing director, although the government is the sole shareholder. All financing has to be voted by the Norwegian Parliament.

Use of electricity, an inexpensive source of power in Norway, is the key to the mill's construction. Electricity is used in making pig iron as well as in electric arc steelmaking furnaces. Iron ore concentrates from taconite are used in pig iron production.

It is planned to develop large deposits of low-grade iron ore in the nearby Dunderland valley for future steelmaking. Norwegian scientists have developed a new processing method which they contend will assure high quality concentrates. Limestone deposits are near the mill locality.

The steel works was begun in 1946, by unanimous decision of Parliament, near the small town of Mo-i-Rana which had a population of only 2500. Modern homes have been built to house some 5,000 plant workers and school facilities have also been built in the near-Arctic community.

In conjunction with the new plant, Norsk Jernverk A/S has built a 750-ft dock to handle 400,000 tons of ore a year, a 2-mile railroad from the dock to the plant site, storage facilities, a sintering plant with an annual capacity of 300,000 tons, and a 2 million cu ft gas tank for fuel for reheating furnaces.



ARCTIC CIRCLE site for Norway's first integrated steel operations was chosen because of inexpensive electric power, taconite availability.

## BOBBY PINS: Little Things Mean a Lot

Women stick 10,000 tons of steel in their hair each year . . . Bobbed hair brought spring-type pins to the fore . . . Special wire permits automatic manufacture, assures securely-clipped locks.



**MIGHTY MITE:** Vital link in American charm, bobby pins of Flamingo Products, Inc., call for precise manufacture, add up to big business.

♦ FOR MOST men hair styles are an "uh-huh" subject. But they're big business to bobby pin manufacturers. Each year millions of pins go into American women's hair and a lot of high precision manufacturing goes into the making of every little pin. The industry consumes some 10,000 tons of

steel. To keep soft locks smartly propped, producers of bobby pins first use steel wire made to exact specifications. Wire must have springiness so it will act as a hair clip; it must be free of hard or soft spots that would cause breakage and jam production machines. Width is held to close tolerance.

The proper grade of wire is drawn round and shaped into a half-oval cross section. An oil coating is applied to keep out moisture and wire is shipped to the manufacturer in coil form.

High speed forming machines take over at this point. Machines uncoil the wire and coat it with kerosene for lubrication. Same machine straightens, cuts and bends wire, then crimps one side and tips one end slightly open.

With each machine knocking out 250 pins a minute, a battery of formers at Flamingo Products, Inc., Danville, Ill., can produce around 3 million pins a day.

To relieve stresses set up during forming, pins are heat treated at 450° to 650°F. Black or brown enamel goes on pins destined for brunettes. Electro-plating applies gold or silver colors for blondes. Finally the ends of pins are coated with plastic to blunt sharp points.

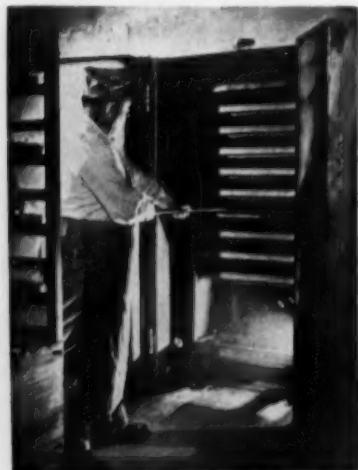
Pin making is precision work.



**WIRE COIL** from Johnson Steel and Wire Co. permits machine forming, gives good service.



**NEWBORN BOBBIES** come off high speed forming machine at the rate of 250 a minute.



**HEAT TREATING** oven receives pins and cooks them for 40 to 60 minutes to relieve stresses.

## EXECUTIVES: Planned Futures Pay Off

**Latest survey points to upswing in management training . . . Over half the programs only 5-10 years old . . . "Excellent to good" results are in majority . . . Steel companies among the early pioneers.**

♦ **THE INDUSTRIAL COUNTRY-SIDE** is blossoming these days with Executive Development Plans, Management Development Plans, Reserve Group Plans and similar projects.

Today's industry leadership is growing tomorrow's budding sprouts in scientifically-nurtured climates. Their slogan: executives are made, not born.

Recent survey by American Management Assn.—covering 1954 and early '55—spotlights the upswing in planned development programs in the past year. Questionnaires mailed to 2000 AMA and non-AMA members brought back 587 replies.

### Majority Have Them

Respondents range from companies having upward of 5000 employees to firms employing less than 1000 persons. Based on company estimates, the survey represents an aggregate total of 2,484,200 non-management and 252,600 supervisory personnel. Sample sprinklings take in all types of firms including metalworking.

Over half—or 54 pct—indicated they have some systematic plan, program or method to facilitate personnel development for management responsibilities. This is 24 pct more than the proportion of firms which indicated use of planned activities in a similar 1952 study. Significantly, an additional 21 pct of respondents reported they have an organizational member to guide such programs, although disclaiming that the company has a "formal" program.

Sampling results reveal that over 60 pct of programs reported are not over 5 years old. Over 80 pct are no more than 10 years old.

Reasons listed for mounting enthusiasm for such programs were

many. They included: (1) to get better performance on today's job, (2) to make certain that management is kept modern, as in engineering and other skills. One respondent pointed out, "Business and industry can no longer depend on 'natural selection' or the evolutionary growth of executives."

Estimated results of programs to date indicate that 20 pct of the companies feel they're "excellent." Generally "good" results were reported by 35 pct of respondents. Approximately 2 pct felt dissatisfied or expressed no opinion.

On a cost and profit basis, one large steel producer reported, "the program has developed increased acceptance of company programs—tangible savings in certain of our operations."

Two long-time proponents of successful training programs are Bethlehem Steel Co. and U. S. Steel Corp.

Bethlehem's "Loop" course has been in operation since 1922. It enrolls about 100 college graduates annually. In addition to the candidate's pay while in training,

the company pays \$3000 to his Alma Mater (if privately endowed)—a dollar and cents estimate of his post-graduate worth as a future industry pace-setter. Last year, Bethlehem paid out \$321,000 to a total of 30 institutions in various sections of the country, according to reports of the company.

### Based on Ability

U. S. Steel Corp.'s program is flexible in design with enrollment varying according to the individual's qualifications and goals and manpower needs of specific divisions. Approximately 70 pct of college graduate candidates are engineers while the remaining 30 pct fill accounting and sales spots. This year, the management development program will draw about 500 graduates from the nation's schools.

General Electric Co., in the business of preparing future executives for over 60 years, presently offers 10 training programs. Self-reliance and initiative are keynotes.

## Guideposts for Planning

### Do

- 1 Develop sound organizational planning, including clearly defined job responsibilities.
- 2 Take continuing executive personnel inventory.
- 3 Design your program to remedy deficiencies, build new skills.
- 4 Recruit future leadership from within wherever possible—stay alert to "new blood" from the outside.

### Don'ts

- 1 Keep a closed mind to new viewpoints, new ideas.
- 2 Heap broader responsibilities on specialists without adequate preparatory training.
- 3 Keep mum on facts that make a man feel a part of the management picture.
- 4 Hold a good man in one spot too long.

## STEEL: Ben Fairless Turns a Corner

**U. S. Steel head steps down after 20 big years . . . Miner's son was dominant figure in production expansion and labor developments of a critical period . . . Roger M. Blough succeeds.**



**COMMAND PASSES** at U. S. Steel Corp. as Roger M. Blough succeeds Benjamin F. Fairless as board chairman and chief executive officer.

◆ **BEN FAIRLESS** has stepped down from the top post at United States Steel Corp.

Roger M. Blough succeeds Mr. Fairless as chairman of the board and chief executive officer of U. S. Steel. Mr. Fairless will continue as a member of the board of directors and the finance committee. He will serve as chairman of the newly formed executive advisory committee of the board.

Mr. Blough moves up from vice chairman and general counsel. A graduate of Yale Law School, he joined the corporation 16 years ago as an associate counsel. He became executive vice president—law and secretary—of U. S. Steel Co. in 1951. Following merger of the company into U. S. Steel Corp., he was elected a director and a member of the finance committee of the corporation.

### Growth Marked Era

In announcing his resignation at U. S. Steel's annual stockholders meeting, Mr. Fairless said he was

turning responsibilities over to "capable and younger hands." Although he regretted stepping aside, he is entirely in accord with the age rule which occasions it. "There must always be room at the top . . . for young men," he said and he expressed "a willingness to perform whatever duties the board may assign. . . ."

Mr. Fairless became president of U. S. Steel in 1938. He has played a leading role in a development that has seen the corporation increase capacity 30 pct, boost shipments 70 pct and expand work force 20 pct.

In his time U. S. Steel has spent \$3.25 billion on capital improvements. Three hundred new steels have been developed. Ore sources have been opened up in Venezuela, Africa and on this continent. The shiny Fairless Works has been completed. The research staff has been enlarged five times.

He is credited with creating a closer sympathy between labor and management. He has been a

dominant figure in the critical wartime, postwar and recession periods from which U. S. Steel has emerged with a production output equal to Russia's entire tonnage. His achievements have earned many honors at home and abroad.

### Came Long Way

Mr. Fairless is a stocky, unpretentious man, known as a low pressure executive with the ability to select and develop good men. His appearance and manner reflect a sturdy background. His knowledge of steelmaking fundamentals stems from a rugged climb through production jobs.

Born in Pigeon Run, O., the son of a coal miner, Ben Fairless worked his way up through the ranks and arrived at the top just when strong leadership was most needed.

## Who's Who at U. S. Steel

**Roger M. Blough** becomes chairman of the board and chief executive officer, succeeding **Benjamin F. Fairless**.

**Clifford F. Hood** remains president and has been designated chief administrative officer.

**John S. Tennant** becomes general counsel, succeeding Mr. Blough in the post. Mr. Tennant had been associate general counsel.

**Enders M. Voorhees**, chairman of the finance committee, and **Robert C. Tyson**, vice-chairman of the finance committee and comptroller, were re-elected to these posts.

Other officer directors remain in previous positions.



## High Points in the Fairless Story

1



2



3



4



5



6



7



(1) **SERIOUS SONS** of Pigeon Run, O., miner, Ben (left) and John Fairless pose for early picture.

(2) **HIGHEST AWARD** for a civilian went to Ben Fairless in 1946 when War Sec. Patterson presented Medal of Merit. Dwight D. Eisenhower watches.

(3) **TOP MEN:** Conference shows Mr. Fairless as U. S. Steel president with Irving S. Olds, then board chairman, and Enders M. Voorhees, finance committee chairman.

(4) **MIGHTY STROKE:** Ground breaking for huge Fairless Works in 1951 draws notables.

(5) **GOODWILL:** Steelmaker Fairless and union leader McDonald on goodwill tour.

(6) **SENATE HEARING** this year finds Mr. Fairless explaining steel industry's role in economy.

(7) **STOCKHOLDERS** hail Ben Fairless as he arrives at May 2 meeting to announce resignation.

## A-BOMB: You Can Survive

**Civil Defense gets shot in arm from test . . . Many residents and industries would have withstood blast . . . Type of construction important . . . Utilities stand.**

♦ **RESURGENCE** of interest in civil defense should follow the A-Bomb blast at Doom Town, immediately re-christened Survival Town in the wake of severe but not total destruction.

Survey teams picking their careful way through the blasted test area found that damage to homes and industrial buildings was high. But many residents and workers in the area would have survived. Equally important, utility installations necessary to sustain life and industry after such an attack withstood the 35-kiloton explosion with remarkable effectiveness.

Detailed studies of the damage can be blueprinted into specific recommendations for home and building construction. First glances indicate that chances of survival of an A-Bomb attack will depend on the type of building rather than distance from the center of a nuclear explosion.

Some houses and industrial buildings were destroyed. Electrical power transmission facilities above ground were wrecked. At the same time, the power station 5500 ft from ground zero appeared to be operable and a 250-w radio transmitter appeared to be intact although the station was knocked off the air. One of the four radio towers was crumpled, another bent.

### Some Houses Stand

The natural gas system of Doom Town remained virtually intact and was undamaged from the 1470 ft mark to 4700 ft. There was no apparent damage to the electrical system 2 miles from ground zero.

The community's dial telephone suffered slight damage, but was repairable.

Damage to houses and other buildings varied considerably, depending on construction material

and design. Two of three dwellings that were destroyed were of frame construction, the third of brick. Their dummy "residents" were crushed and living persons would have been total casualties.

But other homes the same distance from the tower were standing, although their windows were shattered into dangerous needles of flying glass. One was a precast concrete house and the other a reinforced masonry block home.

First Civil Defense inspectors reported that some of the town's industrial buildings survived with moderate to negligible damage.

Encouraging as results were to Civil Defense and industry observers, it should be remembered that the 35-kiloton explosion was a minor blast compared with the hydrogen bomb. But at that it was much larger than the 20-kiloton bombs that leveled Hiroshima and Nagasaki.



**SHELL PRESS** (above) stands virtually undamaged 4700 ft from ground zero. Wreckage of building and dummy "casualties" show blast force.

**DISINTEGRATING** with the full force of the blast, a two story brick house, right, crumbles to the ground. It was also 4700 ft from explosion.





**DARK GLASSES** protected newsmen and Civil Defense officials from eye injury. Photo was made in the light of the atomic explosion.

The test was an anti-climax for those who waited from Apr. 26, original date for the blast, exposing themselves to the cold nights at Yucca Flat and the dice tables of nearby Las Vegas.

Of three different types of industrial structure, only one held up well at 6800 ft from the tower. It was made of  $\frac{1}{8}$  in. steel in vertical fluted panels bolted together. It withstood the blast and received only slight damage. Structure was made by Behlen Mfg. Co.

On another, .026 in. sheet aluminum was ripped from the frame like paper. A building of  $\frac{1}{8}$  in. steel panels without a frame was smashed like a house of cards. At 15,000 ft, a duplicate set of industrial buildings received moderate damage.

As a clue to storing valuable documents against nuclear attacks, it was found that money chests and files placed on the desert floor from 50 to 4700 ft from the blast were badly damaged and only two of 21 test boxes remained usable. Record boxes stored in homes were bent, but in most cases would have protected contents. Many vehicles were damaged and twisted, but a fire-truck standing broadside at 2 miles was still in operating condition.

## VETS: Mental Cases Readjust

**VA study shows 93 pct have jobs . . . Earnings are better than average . . . Many are doing work they like and using skills learned in rehabilitation.**

"SECTION 8" victims of World War II have made remarkable comebacks to civilian life through vocational training.

A Veterans Administration study discloses that 93 of every 100 veterans treated for mental and nervous illnesses now hold down jobs. What's more, nearly all of them like the work they are doing.

At the time of the survey, these vets were earning an average of \$70 a week—\$15 above the weekly income of non-veterans in the same age group for that period.

### Had Higher Disability

The VA study showed that of the 600,000 disabled World War II veterans who received vocational rehabilitation training over the past 12 years, approximately 150,000 had mental or nervous disorders. This was the second largest group of disabled trainees. Only those with orthopedic disabilities such as arm or leg amputations were in greater numbers.

The comeback is more remarkable, the VA points out, because vets with mental or neurological disorders generally have higher disability ratings than other handicapped veterans who have trained.

Taking a closer look at the 93 of 100 rehabilitated patients who were holding jobs, the VA study found that 12 pct had part time jobs, 39 pct had changed jobs one or more times since completing training. These percentages were close to the rate for all disabled veterans.

There was no marked difference in attitude between those with mental or nervous disorders and all other handicapped trainees.

Sixty-four pct of the group like their work "very much," and 30

pct "fairly well." Of other handicapped trainees, 71 pct said "very much," and 27 pct "fairly well."

Of the mentally disturbed group, 56 pct had completed their courses and were declared rehabilitated. Nevertheless, nearly half of those who had failed to go all the way through their rehabilitation training were able to get jobs utilizing skills and knowledge acquired in the training they had received.

Seven out of every 10 rehabilitated veterans in this group were between the ages of 20 and 30. Twenty-five pct had never progressed beyond grade school; 60 pct had gone to high school and 15 pct had some college training.

A far greater proportion of veterans with mental or nervous disorders attended college than did veterans with other disabilities, the VA noted.



"My cousin will test it. He doesn't know what fear is."

## DO-IT-YOURSELF: It Grosses Billions

**Leisure time, high cost of services, ring up \$7 billion annual market . . . Power tool makers benefit from growing market of "doers." . . . Big companies compete with show displays—By D. G. Picinich.**

♦ NICKELS, DIMES and quarters from the nation's growing thousands of do-it-yourself fans are ringing cash registers to the tune of an estimated \$6-\$7 billion a year.

Economists who have studied the rising do-it-yourself trend, view the home "doer" cult as no passing fancy. Reasons for the stepped up nationwide interest in the movement are: (1) high costs of hiring outside specialists, (2) increased leisure time which allows for such pursuits, and (3) increasing number of diversified products tailored for homeowner application.

Born of economic necessity during the '30's, the movement is now

in its 24th year. Long-time benefactors from the market have been the plywood industry with power tool manufacturers taking increasing bites in recent years.

Last year, tool expenditure by homeowners was about \$14 million in purchases and rentals. With almost one out of every two homes equipped with a workshop, tool makers look for a steady upswing in the ranks of the current 12 million home workshop force.

Do-It-Yourself Shows, launched by Orkin Expositions Management, in New York City in March, 1953, have been attracting serious-minded "doers" month-in, month-out for the past two years. Twenty nationwide shows were viewed by

an estimated 2 million lookers and buyers last year. Attendance estimates for this year range around 3 million.

### Makers Show How

Manufacturers, sensing the expanding market, have already formed an "American How-To Council." The Council is a non-profit organization which acts as a clearing house for dissemination of information, material and ideas to help members do a better job in the "how-to" field. Managing Director is Donald R. Brann, president of the Easi-Bild Pattern Co., Pleasantville, N. Y.

Among firms represented is Reynolds Metals Co., which entered the do-it-yourself field a year and a half ago.

Reynolds' soft alloy aluminum is sold by some 10,000 hardware and other retail outlets throughout the country in sheet, foil, rod, bar, tubing and angle—designed for use by home craftsmen.

Important selling point is that it can be formed with hand or power tools ordinarily used for woodworking. The firm has been a consistent Do-It-Yourself Show exhibitor in addition to regular TV and newspaper advertising aimed at the home crafter.

### Steel Market

Cross Engineering Co., Carbon-dale, Pa., has introduced thousands of visitors to its specially designed perforated steel panels with attractive Do-It-Yourself Show displays. Among the "1001" suggested applications for the product are baskets, hampers, room dividers, ventilation coverings, furniture, window guards and drapery valances.

Bearing such imaginative titles as "Gateway," "Star," "Imperial"



### How Big Is Do-It-Yourself?

Growth of the do-it-yourself fad has been one of the most pronounced trends of the postwar years. It's been caused by the big jump in home ownership, the higher cost of having someone else do it for you, the increase in leisure time and the greater number of kits, products, setups manufacturers have put out to cash in on the do-it-yourself urge. It's a big market now and it's growing:

- Do-it-yourself fans are now spending between \$6-\$7 billion on their hobby.
- Last year homeowners spent about \$14 million for tool purchases and rentals alone.
- It's estimated that almost one out of every two homes has a workshop.
- The do-it-yourself cult now numbers about 12 million people—is increasing all the time.
- Attendance at do-it-yourself shows this year is expected to run around 3 million, up 1 million over last year.



and "Moire," the designs are packaged in A, B and C units and distributed through a nationwide warehouse system including Canada. Some 20,000 hardware, building material, general stores and sheet metal suppliers are retail outlets.

Package units, comprising 11 designs, are sold in various sizes, weights and gages. Costs per sq ft range from 25¢ to 50¢ depending on quantity purchased, kind of steel and gage, and design or designs desired.

Hard-hitting sales promotion with dealer selling aids, a self-selection panel rack and instructional plans for home users have helped establish a solid buying market in recent years.

Sheets are easily worked with tinsmith's snips and in most cases can be formed by hand. In addition, the metal can be welded, painted, enameled, lacquered or otherwise finished to blend with home decor.

### Fight Freight Hike

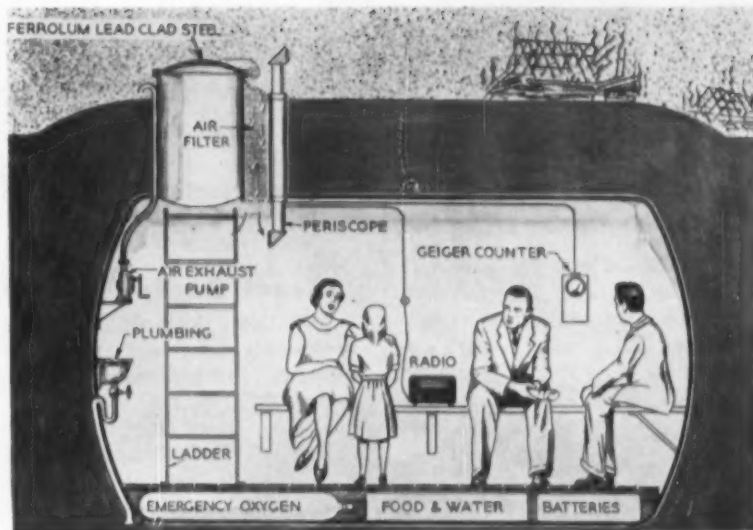
Hard and soft coal producers are joining to ask the Interstate Commerce Commission to toss out a 12 pct hike in the railroad rates on coal approved in 1952.

Railroads asked ICC to make permanent the coal increase which, along with a general 15 pct boost in freight rates, expires next Dec. 31. The Anthracite Institute asked the commission to rule that the increase on hard coal rates was "unjust, unreasonable, and excessive." It cited the industry's "deplorable economic position."



"The part I don't like about parking is that noisy crash!"

May 12, 1955



**BLAST PROOF:** Steel bomb shelter of Knapp Mills, Inc., Wilmington, Del., features lead shielding and air filtering system, goes down 4 ft in ground and sells for price of new car.

## Bomb Shelter:

### Market lead-coated steel bomb shelter

You can have a bomb shelter in your own backyard. All you need is the space and the purchase price of around \$3500.

Being marketed by Knapp Mills, Inc., Wilmington, Del., the Ferrolum Rayist Shelter consists of a heavy gage steel room which is buried about 4 ft in the ground. The steel structure is lead-coated for protection against radioactivity.

A standard unit can house up to six people, has storage space for food, water, clothing and is equipped with sanitary facilities. Air is purified and filtered through a forced air ventilation system which removes radioactive particles from the outside air.

The shelter is equipped with instruments to detect outside radiation so that people inside the shelter can tell when it is safe to leave. Lights, communications and other accessories are operated from a self-contained power source. A periscope arrangement enables

people in the shelter to see out.

Knapp Mills, one of several companies now making bomb shelters, also sees use for the unit as protection against hurricanes, dust storms, etc.

### Draft Rate Drops

The Army's lessened demand for draftees is to drop still further in October. The rate of call-ups has been running around 10,000 per month, a sharp cut-back from 2 years ago when more than 20,000 men per month were tapped for military duty. Starting in October, the draft rate will drop to about 9000 men per month.

The Navy, the Air Force, and the Marine Corps still are successful in keeping their ranks up to authorized strength with volunteer enlistments. They have not asked selective service officials for draftees since the Korean War.

Army's manpower problem is further complicated by the continued decline of its "average experience level." In 1950, for example, the Defense Dept. reenlisted about 59 pct of its regular (i. e., non-draftee) strength. Today, the rate has dropped to about 24 pct.

## Capacitors:

**GE plans \$6.4 million plant to meet color TV market.**

Construction will get underway shortly on General Electric Co.'s new aluminum electrolytic capacitor production plant near Columbia, S. C. Cost of the main one-story windowless, air-conditioned production facility and auxiliary service structures is estimated at approximately \$6.4 million.

Limited output is slated to begin early in 1956 and is aimed at meeting anticipated growth of the color television market.

The plant is expected to use about 35 million kwh of electric power annually. The manufacturing process will require an estimated 1000 gal of cooling water per minute.

Selection of the 135-acre site at

Irmo, S. C., was dependent on the absence of air pollutants for maximum protection of the oxide film on the aluminum foil capacitors.

## Erect Container Site

U. S. Steel Corp. Products Div. is constructing a new steel drum container and pail plant in Pennsauken Twp., N. J.

Annual output from the 168,000 sq ft facility will be approximately 2.3 million drums and 3.2 million pails.

Production units will include a 55 gal high-speed drum line, a combination heavy-drum line, a combination light-drum and grease-drum line and one high-speed pail line.

Containers, chiefly for the petroleum and chemical industries, will range from 3½ to 7 gal pails up to 100 lb grease drums and 55 gal oil drums.

## Replace Old Foundry

Chambersburg Engineering Co., Chambersburg, Pa., has begun construction of a new 48,000 sq ft iron foundry to replace present facilities in operation since 1906.

Production at the new plant is slated for October with an estimated monthly capacity of 750 tons of castings. Weight variance of castings ranges from 1000 lbs to 60,000 lbs.

Foundry materials at the new site will be mechanically handled. Production operations will be grouped in one bay served by one 60 ton and one 30 ton bridge crane and four 5-ton gantry cranes.

## Adds Cold-Rolled Mill

Southeastern Metals Co., Birmingham, is adding a cold-rolled division to its steel tube manufacturing plant. Cost of the new facility is estimated at \$1 million.

The plant is expected to be in operation about July 1.

## Open Saw Plant

American Saw & Mfg. Co., Springfield, Mass., has begun operation of a new hack saw plant at East Longmeadow, Mass.

The facility is a one-story building built around a straight line production system.

Steel for blades enters at one end of the plant and moves continuously through a series of production, heat treatment, and inspection steps to stock facilities at the other end.

Key production equipment for the installation was designed and built by the company's machine tool division.

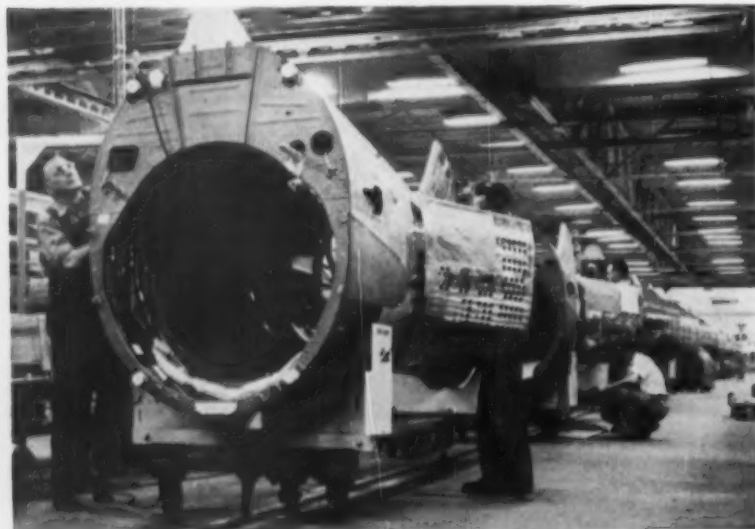
## Build British Plant

Borg-Warner, Ltd., a newly created subsidiary of Borg-Warner Corp., Chicago, is building a multi-million dollar plant at Letchworth, Eng.

The new facility will produce automatic transmissions, semi-automatic overdrives and other components for the British auto industry.

The name Borg-Warner Ltd replaces that of Morse Chain Ltd which has produced chains and sprockets at Letchworth since 1919.

MILITARY aircraft assemblies move down automatic assembly lines at Temco Aircraft for first time in ten years. Volume of contracts since World War II did not warrant use of automatic lines until assemblies for F-84 fighter-bombers recently reactivated conveyor installations.



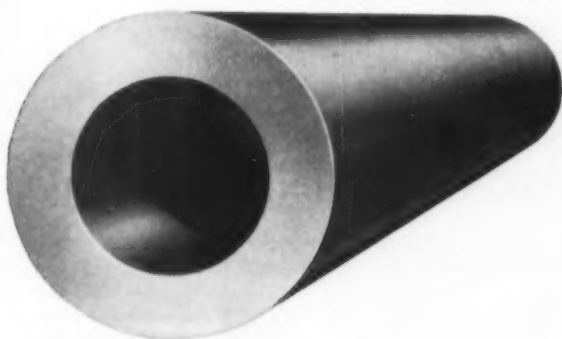
# When you make hollow parts . . .

**Why use  
bar stock?**



---

**start with  
seamless tubing**



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**W**HY bore out bar stock to make hollow parts when Timken® seamless steel tubing lets you start production with the center hole already there? You don't waste steel and you save machining costs, too. Finish boring is often your first production step. Screw machine stations can be released for other jobs. So you add machining capacity without adding machines. And you save money because you pay only for the steel you use.

Our engineers will save you even more money, too, by studying your problem and recommending the most economical tube size for your hollow parts jobs,

guaranteed to clean up to your finished dimensions.

You also get fine forged quality in Timken seamless steel tubing. The piercing process by which it is made is basically a forging operation.

It gives the tubing a uniform spiral grain flow for greater strength, and a refined grain structure which brings out the best in the quality of the metal. The Timken Company's rigid quality control keeps this quality uniform from tube to tube and heat to heat. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

May 12, 1955

67

# AUTOMATION

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AUTOINSPECTION  
SYSTEMS, CIRCUITS  
AND CONTROLS  
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BUSINESS FOR  
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DECADE. IT  
WILL PAY YOU  
TO CHECK YOUR  
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THE SHEFFIELD CORPORATION  
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# SHEFFIELD

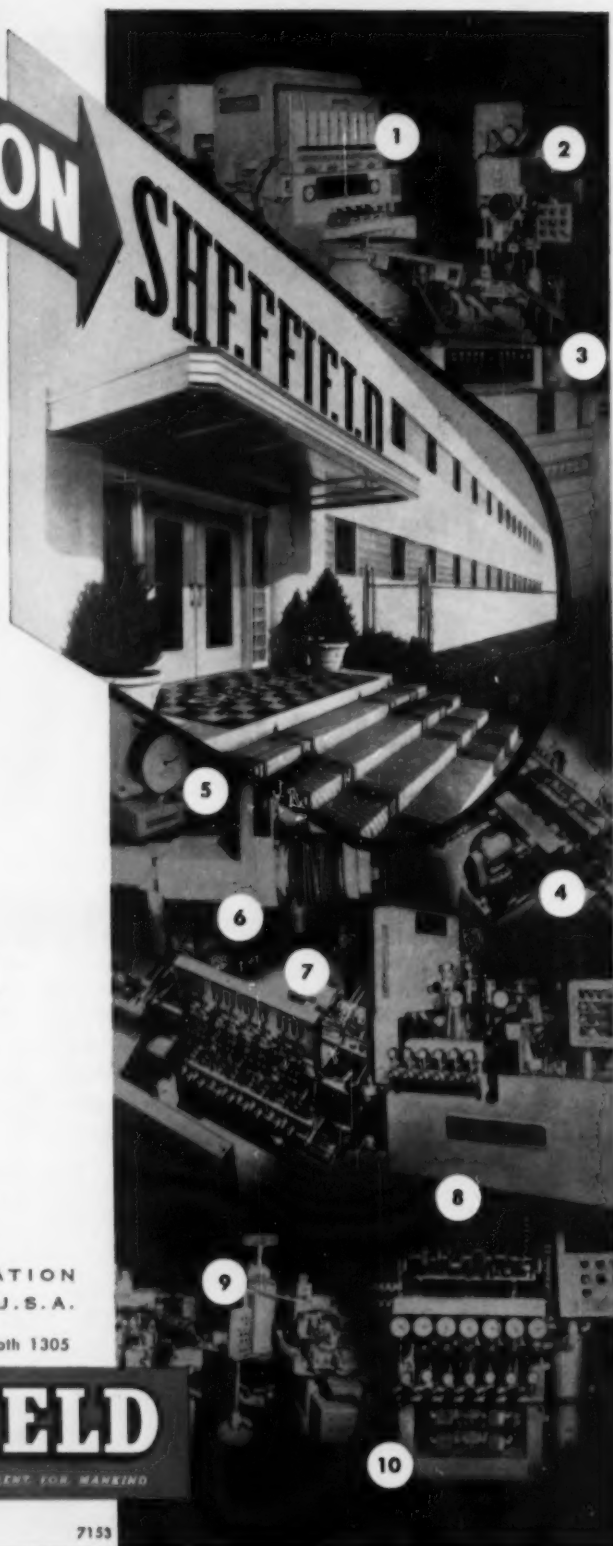
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- 1 Gaging cylinder bores for selective assembly
- 2 Controlled honing of gear blank bores
- 3 Automatic gage for 100% inspection of small arms ammunition

- 4 Connecting rod inspection
- 5 Controlling the grinding of ball bearing races
- 6 Post-process size control of bearing races

- 7 In-line inspection of automobile part
- 8 Controlling 12 grinding machines
- 9 Controlling bore size of pinion blanks
- 10 Automatic gaging of crankshaft main bearings





# 91 days Continuous Production ... with Talide<sup>®</sup>-TIPPED CENTERLESS BLADES



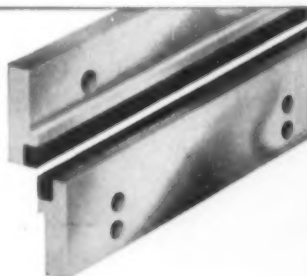
## LARGE ELECTRIC MOTOR PLANT

**PART**.....Stainless Steel Rotor Shaft for Electric Motor.  
**OPERATION**.....Grind 7 diameters simultaneously.  
**MACHINE**.....No. 2 Cincinnati Centerless Grinder.  
**BLADE**.....Special multiple step Talide-tipped work support blade No. C-4884.  
**RESULTS**.....Talide-tipped blade in continuous production for 91 days (2 turns per day) compared to best previous production run of 3 days with hard alloy steel blade.

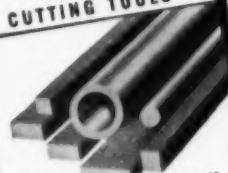
Talide-tipped centerless grinder blades are stocked in over 50 styles and sizes for all types of infeed and thru-feed operations. Special blades for form work including tapered pins and arbors, shafts having multiple diameters, and parts with special contours can be supplied to order. Send print or sketch for quotation.

## 800,000 CUTS WITH TALIDE SHEAR BLADE!

A leading electrical manufacturer shearing .014" silicon steel for transformers has completely equipped their press line with Talide-tipped blades in lengths ranging from 17" to 64". Blade life is averaging 800,000 cuts per grind compared to 10,000 cuts obtained with steel blades, and customer estimates annual savings of \$18,000.



### CUTTING TOOLS



### SOLID BAR STOCK



### DRAWING DIES



### ROLLING MILL WORK ROLLS

One-piece Talide strip (up to 100" without seams) prevents scoring and scratching. Write for new 84-page Catalog 55-G or ask for sales engineer to call. Metal Carbides Corporation, Youngstown 7, O.

## LARGE SAFETY RAZOR COMPANY NETS \$20,000 SAVING!

After unsuccessfully experimenting with several other brands of carbide knives, the world's largest razor blade company tested and accepted Talide rotary knives as being far superior to any knife for the gang slitting of razor blade strip steel.

Phenomenal runs of 90 to 1 over hi-carbon, hi-chrome knives and the smoother, burr-free cuts obtained have reduced customer's slitting expense by more than \$20,000. Over 1200 coils were gang slitted with Talide knives compared to an average of 15 coils with steel knives. More tonnage was produced in 1 regrind of the Talide knives than over the entire life of a set of steel knives.

Outstanding production runs like this are possible because of the extra dense and porous-free structure of Talide metal. Try Talide blades and knives on your next shearing or slitting job. They're hard to beat and harder to wear out!



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 HEAVY METAL • CERMETS • HIGH TEMPERATURE ALLOYS  
 OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY



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### Products

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HIGH SPEED STEELS  
NON-MAGNETIC STEELS  
HIGH SPEED TOOL BITS  
HEAT RESISTING STEELS  
STAINLESS-CLAD PLATES  
TOOL STEELS FOR SPECIAL PURPOSES  
CARBON AND ALLOY STEELS  
CAST-TO-SHAPE TOOL STEELS  
HIGH SPEED AND ALLOY SAW STEELS  
TEMPERED AND GROUND STRIP STEEL  
COMPOSITE HIGH SPEED STEELS  
STAINLESS AND HEAT RESISTING CASTINGS  
COMPOSITE DIE STEEL SECTIONS  
PRECISION GROUND FLAT STOCK  
DIE STEELS—HOT AND COLD WORK

# JESSOP

STEEL COMPANY • WASHINGTON, PENNSYLVANIA

## Report To Management

### Government Moves to Cool the Boom

Keep your eyes on Washington. The government is subtly but definitely moving to cool the business boom so that it won't get fouled in an outright inflation.

First move in this direction has been a tightening of credit. In line with this, margin requirement on stocks has been increased, but so far this has not had any dampening effect on the buoyant stock market.

### Is It a Big Business Prosperity?

One unfortunate characteristic of the current business surge has been the fact that the recovery has been more general among large firms than among small ones.

During the recession large and small firms shared about equally in the decline. Early in '54 about 62 pct of large firms (assets over \$50 million) reported a decrease in sales compared with a sales loss for 65 pct of smaller firms. In the recovery phase, however, 73 pct of large companies have seen their sales increase over year-ago levels, while only 58 pct of small companies report higher sales volume.

For durable goods industries, sales early this year increased for 69 pct of large companies compared with a gain for only 54 pct of small companies. On new orders, 86 pct of large durables manufacturers are doing better this year than last compared with increases for 73 pct of the small firms. Forty-five pct of large durable goods producers have more unfilled orders than a year ago, while 38 pct of small firms show an increase in this category.

### Sell Cars, Not Credit . . .

Concern is growing over the wild credit terms being offered by auto dealers. Responsible industry leaders point out that auto stylists and designers worked for more than 3 years to make the '55's as appealing as possible but the only

feature a lot of dealers are selling is lifetime-to-pay financing deals.

Auto production pace through first quarter was running at rate of better than 2 million cars per year more than in record 1950. By the end of April, automakers had reached the 3 million car point. This is the earliest date that number of cars has ever been produced.

### What Businessmen Are Thinking

How do businessmen and industrial leaders feel about extension of the Reciprocal Trade Act and a 90¢ minimum wage? Well, in New England both proposals are receiving solid support.

Survey by New England Council of more than 600 businessmen shows extension of the Reciprocal Trade Act is favored by four out of five, while 90¢ minimum wage has the approval of two out of three.

As is always the case, however, some of those favoring extension of the trade act wanted exemption for certain commodities. Most frequently mentioned were textiles, materials vital to national defense, machine tools, watches, leather goods and jewelry.

Other findings: New England businessmen want to postpone any tax cuts until the budget is balanced, want government financial aid in research and development of atomic power plants.

### Made \$11.2 Billion Last Year

Final '54 report is in on how well manufacturing companies did financially last year. What it shows: Net profits held at previous year's level of about \$11.2 billion despite a 7 pct drop in sales. Big factor in the solid earnings record piled up despite the recession was, of course, the end of the excess profits tax. All told, federal income taxes last year declined 26 pct.

## INDUSTRIAL BRIEFS

**Division Added . . .** Establishment of a Die Supply Div. was announced by E. W. Bliss Co. The division, formerly the Die Supply Co. until its acquisition by Bliss, is located at 1400 Brookpark Road, Cleveland.

**Another Plant . . .** A division to manufacture electrical distribution transformers will be added to the Gadsden, Ala., plant of Allis-Chalmers Mfg. Co. Production at the new facility is expected to start before the end of this year.

**Anniversary . . .** Employees of American Cast Iron Pipe Co., Birmingham, Ala., marked the 50th anniversary of the founding of the company by unveiling a bronze statue of the company's founder, John J. Egan.

**Texas Move . . .** A new store and warehouse building, which also includes the company's district office, has been opened at Corpus Christi by The National Supply Co.

**Scholarships . . .** Eight 4-year college scholarships were awarded this year by American Can Co., making a total of 23 since the firm inaugurated its program in 1953. Awards were made to eight children of employees in Canco's four geographical divisions.

**Contract Awarded . . .** A general contract for completion of Western Electric's Merrimack Valley plant in North Andover, Mass., has been awarded to the Turner Construction Co. Work will get under way immediately.

**More Furnaces . . .** Sharon Steel Corp. has awarded a contract to The Gas Machinery Co., Cleveland, to furnish two preheat furnaces to increase the production in the Catenary type strip annealing furnaces.

**Business Purchased . . .** Purchase of the paint spray business of Kellogg Div. of American Brake Shoe Co. was announced by the M & E Manufacturing Co., Indianapolis. Purchase involves all patents, designs, tools, equipment.

**Turbines Manufactured . . .** Solar Aircraft Co. has begun manufacture of pod-mounted gas turbine power units for Convair C-131B flying electronic laboratories. It marks the third major aircraft firm to purchase Solar's Mars gas turbine airborne generators.

**Merger Recommended . . .** Presidents of Borg-Warner Corp. and Byron Jackson Co. will recommend to their respective boards of directors that the two companies merge. Merger plan is on the basis of four shares of Borg-Warner for five shares of Byron Jackson stock.

**Titanium Grade . . .** A new grade of titanium metal for use as an addition agent in the manufacture of ferrous and non-ferrous alloys was announced by the Du Pont Co. Grade is designated as Titanium Metal-Grade NDA.

**Unification . . .** Sales and service functions of Consolidated Engineering Corp. and its wholly-owned subsidiary, Consolidated Vacuum Corp. have been merged in a unification of the marketing activity of the two companies.

**West Move . . .** A new warehouse to provide faster delivery service to West Coast customers has been opened by the Fulton Sylphon Div. of Robertshaw-Fulton Controls Co. at Lynwood, Calif.

**Consolidation . . .** Stockholders of Hooker Electrochemical Co. and Durez Plastics and Chemicals, Inc. have formally approved consolidation of the two companies.

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NATION'S LARGEST  
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looking for opportunities to cut  
slag-handling costs.

**SPECIAL QUALIFICATIONS**—Corrugated walls to increase radiating surface and cooling speed • curved sidewalls to prevent cracking and inward creep • bottom support brackets to relieve strain at critical sections • expansible rims to resist distortion.

**FAMILY HISTORY**—in actual use for over a quarter of a century with a reputation for constant efficiency, economical upkeep and long life.

**BEST REFERENCES**—from most of today's prominent plants in the ferrous and non-ferrous industries. Prefer being placed side by side with other cinder pots in your slag train for comparison of performance and service. Will operate effectively 24 hours a day on any slag train at blast furnace, open hearth or electric furnace. Available for immediate duty.

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If you have a slag disposal job, why not make a practical cost comparison test by employing fully proved, dependable, low cost per ton Johnston Corrugated Cinder Pots? Write for complete descriptive Bulletin.



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DIVISION OF E. W. BLISS COMPANY

Makers of the rolls with the striped red wabblers  
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**MACKINTOSH-HEMPHILL PRODUCTS INCLUDE:** all types of cast mill rolls . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mockintosh-Hemphill rotary straighteners . . . electronically controlled contouring lathes . . . screw feed roll turning lathes . . . heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills.





## Is Detroit Selling Next Year's Cars?

**Industry spokesmen contend demand is ahead of supply . . . Cite intense competition . . . Others question financing of new car purchases . . . Girls give styling opinions at Hudson forum—By T. L. Carry.**

♦ **PREDICTIONS** on the number of cars that will be produced this year are running as high as 8½ to 9 million. To some this means that the auto industry is taking itself out of the market for next year. Others, like Henry Ford II, Ford Motor Co. president, say this is not so.

Mr. Ford said recently that his company can't keep up with the demand for its products. He suggested that the country may be riding the crest of a new type of consumer demand that will result in even greater highs in production and prosperity. To prove his faith in this new era, Mr. Ford announced that his firm is going to spend an additional \$625 million

in the next three years on new plants and equipment.

In the same vein, L. L. Colbert, Chrysler Corp. president, recently took a look into the future. He cited the intense competition in the industry as the reason for this year's record production and sales. The record sales, according to Mr. Colbert, are an indication of the public's confidence in the country's future prosperity.

**Some Pessimistic . . .** He expressed confidence in the economy's long-range prospects and predicted that by 1975 a family owning three cars would be the rule rather than the exception.

On the other hand, a note of

pessimism is occasionally dropped into the picture. The reasoning of what are sometimes referred to as the "gloom and doom" boys goes something like this:

Because of the high production maintained by the factories, the pressure is on the dealer to sell the cars. The only way to do this and stay in business is to either cut prices and hope for a bigger sales volume or offer the customer easy credit terms.

These terms are so appealing that people who ordinarily would wait to buy a car cannot resist and are coming into the market now. Therefore, they say, sales next year will be much lower.

**Balloon Financing . . .** Time payments have also come in for their share of criticism. In some cases, dealers may be selling credit instead of product. They have been accused of leasing cars.

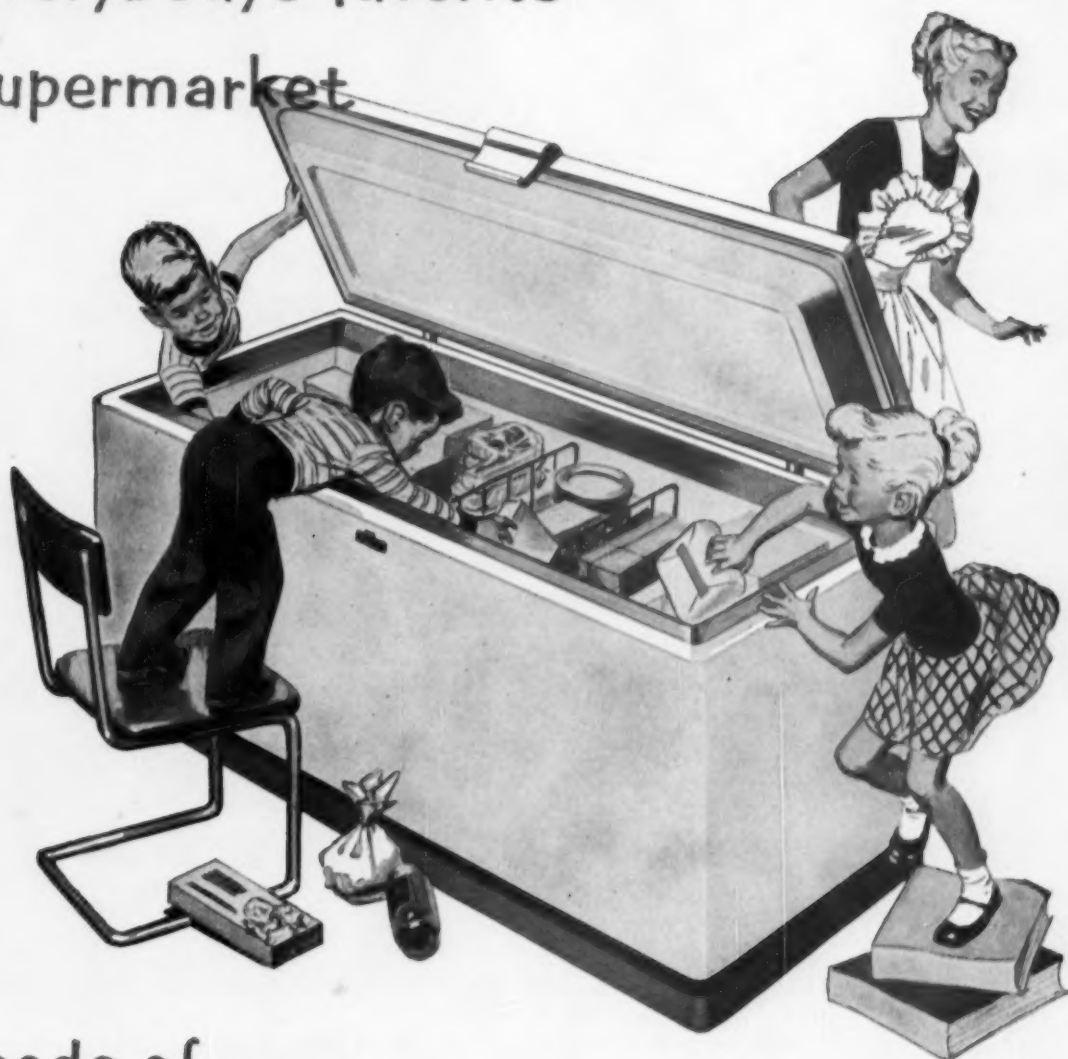
In one specific case which was observed first hand, a salesman offered to sell a customer a car on an 18 month "balloon note." Under this system, payments would be small for 17 months and the balance, or balloon, would be due the 18th month. But, the salesman said, when the balloon portion of the note becomes due, it can be refinanced for another 18 months.

The answer to this criticism is that this type of car deal is rare. Besides, reputable dealers and loan agencies will not consider such propositions. With the spring buying season now in full swing, auto finance companies are enjoying a booming loan business. From a credit standpoint, this does not mean that people who might have



**SCALED MODEL** enabled Ford Motor Co. engineers to plan the flow of cars and placement of machinery at New Louisville assembly plant months before the site was chosen. Space for each job was figured in advance.

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**gives you more cuts, longer life, lower costs!**

Here's a tough, edge-holding metal cutting band saw blade that gives you a real bonus in smooth, fast cutting and long life.

Made of extra tough, wear-resistant alloy steel, Simonds "Bonus" Bands have sharp, perfectly formed teeth -- set with absolute evenness on both sides of the blade. Hardened along the tooth edge only by controlled heat treatment, they combine maximum cut-ability with flexibility and resistance

to breakage, provide the ultimate in trouble-free service.

All standard widths and tooth spacings are furnished in 100' and 250' coils or welded to specified length. Ask your local Simonds Industrial Supply Distributor for more information on the complete line of Simonds "Bonus" Band Saws.

**For Fast Service  
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Complete Stocks**



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Simonds Abrasive Co., Phila., Pa., and Arrida, Que., Canada



## Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
May 7, 1955	190,340*	34,016*
Apr. 30, 1955	195,587	35,435
May 8, 1954	130,717	23,923
May 1, 1954	133,800	25,406

\*Estimated Source: Ward's Reports

waited are buying this year's cars.

Elmer A. Rolley, vice-president of Universal C.I.T. Credit Corp., admits that car financing volume has increased but adds that at least 676,000 Michigan car owners will finish their car payments sometime this year. By the end of the year, Mr. Rolley estimates, nearly 10 million car buyers will have paid on their contracts.

## New Headlamp Ready

A new type of sealed-beam headlamp, developed on an industry-wide basis, will be fitted to new cars as standard equipment beginning in mid-July. The new lamp, which was first announced last fall, contains a cap which fits over the filament and blocks any stray light rays.

The Automobile Manufacturers Assn. says these new units have several advantages over present headlights. They result in better night visibility and give as much as 80 ft more seeing distance along the right side when the lower beam is used. In addition, glare is cut considerably in adverse weather conditions.

The delay in installing the new lamps at the factory has been caused by legal difficulties. Each state legislature regulates standards for a car's headlights. Three states, Georgia, Alabama and Florida have not as yet approved the lights, but are expected to do so by July.

## College Goes to Ford

In an effort to have college professors become better acquainted with the automobile industry, the Ford Motor Co. will sponsor an educational forum in Dearborn this summer. Scheduled to take place from July 17 to 30, educa-

tors from 34 cities across the nation where Ford plants are located will attend.

Purpose of the forum is to enable teachers to check their ideas and theories against actual practices in a major industry. Topics for study and discussion will include the organization, administration and marketings.

Henry Ford II, president of the company, said the forum aims at giving educators a better knowledge of business.

## Women's Want

**Economy first, then driving convenience.**

The question of what a woman looks for in a car was partially answered recently when a panel of six women drivers presented their views to a group of sales, design and auto engineers of the Hudson Div. of American Motors Corp.

It was generally agreed among the thrifty ladies that the first thing they consider when buying a car is its cost. This includes both the original price and the cost of operating the vehicle. They

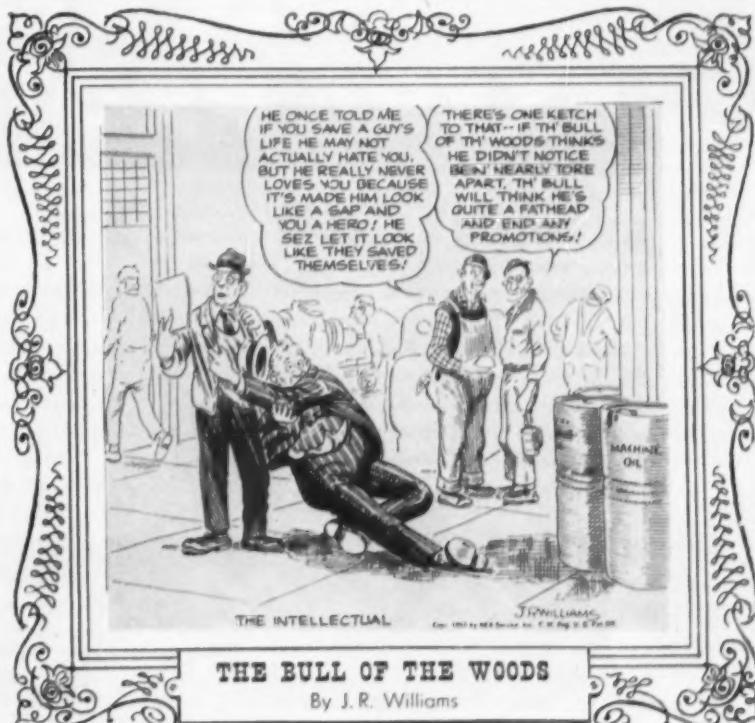
## Automotive News

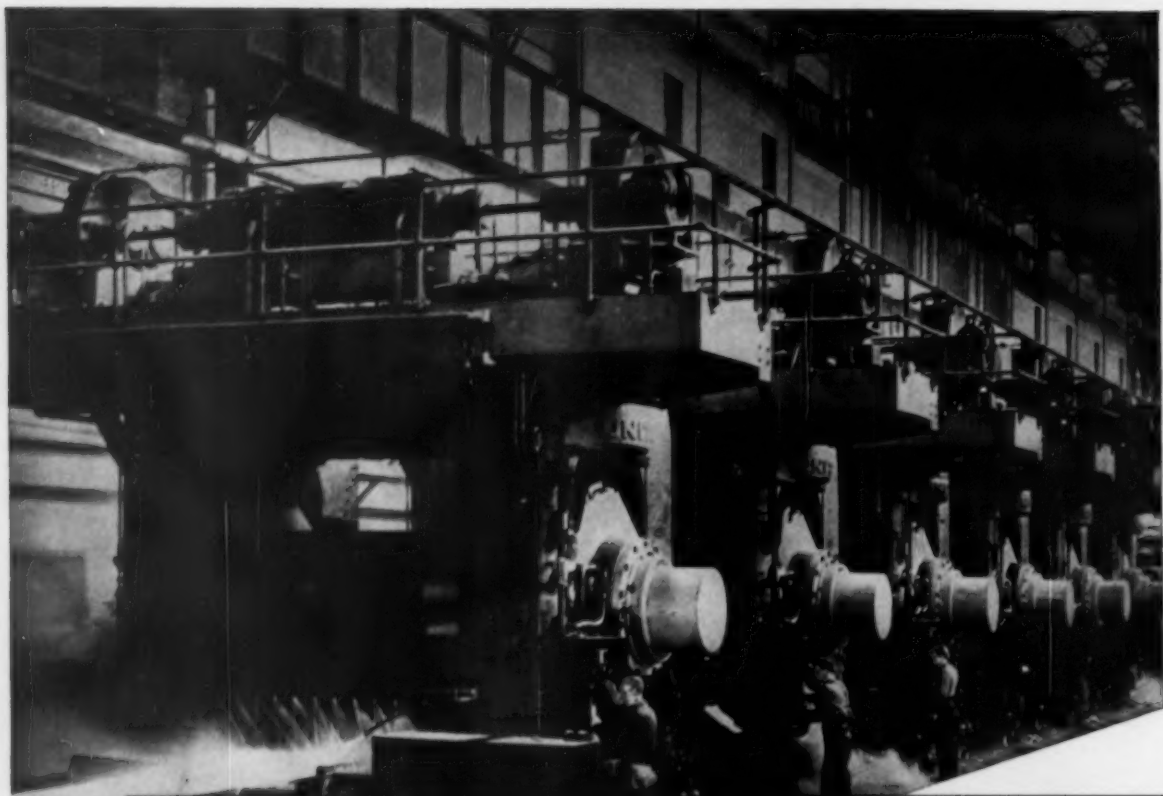
also expressed the opinion that the car, although it did not have to be big, should be roomy and easily handled for parking purposes.

From there on, opinions began to differ. The type of car desired varied with the occupations on the panel. Station wagons were preferred by a housewife living in the suburbs. Two-door cars were considered important for families with children and four-door autos were desired if the driver could control all the locks on the doors.

Like Extras . . . Power steering, power brakes and hydramatic transmission were considered "must" items, although, as one member of the panel, a model, put it, "these things are like a mink coat—nice if you have one."

The panel had a number of complaints to register with the Hudson officials. A woman who is 5 ft 2 in. tall said cars should have adjustable brake pedals. She complained that everytime she reached up to apply her brakes, she honked the horn on the steering wheel with her chin.





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**BY USING** *Texaco Regal Oil* in the circulating systems of your roll stands, you'll assure smoother, more dependable operation . . . longer bearing life . . . lower maintenance costs.

*Texaco Regal Oil* is a high quality, heavy duty oil that affords *extra protection* because of its high resistance to oxidation, emulsification and sludging, and its ability to separate rapidly from water. This keeps lines clear and bearings clean for trouble-free performance and minimum wear.

For your enclosed reduction gears, use *Texaco Meropa Lubricant*—noted for its EP stability, its resistance to oxidation, thickening and foaming.

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TUNE IN . . . TEXACO STAR THEATER starring DONALD O'CONNOR or JIMMY DURANTE on television . . . Saturday nights, NBC.



## More Defense Business Goes Abroad

**Defense Dept. says cheaper costs, help for allies dictate added foreign procurement . . . Delaware dredging project drags . . . Tax snooping curbs, federal smog control, engineer shortage—By G. H. Baker.**

♦ **OFF-SHORE** buying of military supplies is to rise in the months ahead. Despite squawks registered at the Pentagon by a number of U. S. manufacturers hungry for orders, a top-level decision has been reached to step up purchasing from U. S. allies.

Military men point out two chief advantages: (1) Lower prices, due to cheaper labor and production costs; (2) It's a convenient means of building and maintaining the industrial capability of our allies.

As the Defense Dept. looks at offshore procurement, the diversion of business from U. S. manufacturers is the price to be paid Western Europe and Japan for developing "real collective security."

**Curb Tax Snooping . . .** Congressional committees will not find it quite as easy in the future to take a peek at the income tax returns of corporations and individuals under a new White House order.

For the past two sessions President Eisenhower has given congressional committees authority to examine tax returns if the chairmen make the request. For the next session, however, tax returns will be made available only when they are requested by a resolution adopted by a full congressional committee.

In addition, the President's order requires that any information gleaned from the returns must be "confidential," but permits the committees to report "information pertinent to their investigations" to the Senate and House.

However this does not indicate

any general slackening in the government's interest in earnings. Treasury officials are asking for an added \$7.5 million for the new fiscal year. Most of this would go for hiring new agents to check tax returns. Revenue people say the hike would more than pay for itself in tax dollars uncovered.

### **Delaware Digging Drags . . .**

Plans for a deeper Delaware River fail to stir Congress into voting a requested \$25 million in dredging funds. There is an increasing amount of political speculation that the project will have to be put off until next year when the usual pre-election volume of vote trading takes place.

Backers of the plan—congressmen, governors and local civic groups from the affected areas between Philadelphia and Trenton—are pressing their case before a subcommittee of the House Appropriations Committee. Reaction to requests to put the \$25 million

starting fund in the supplemental appropriations bill are lukewarm, at best.

President Eisenhower has opposed funds for the project unless "local interests"—presumably primarily U. S. Steel Corp.—will put up \$18 million of the total cost of \$91.3 million. The private contribution represents the difference in cost of a 35-ft channel and the 40-ft channel requested by industry.

**Spread Tax Job . . .** Approval of applications for fast tax write-offs soon will be the job of the appropriate government agency, and not the Office of Defense Mobilization.

ODM, in a move to unload some of its voluminous paperwork, is asking President Eisenhower to issue an executive order which will transfer the responsibility for okaying or denying fast amortization certificates to the Departments of Commerce, Interior, and Agriculture, and to the Defense Transport Administration.

Under the system in use up to now, each application is examined by one of these agencies and then forwarded to ODM for final action. ODM finally decided this is a waste of time. It thinks it can now trust the judgment of the appropriate lower-level agency.

**Seek Smog Solution . . .** Federal action to dispel the big-city problem of smog may be coming up in the weeks ahead. Both the Senate and the House are taking serious interest in new legislation to study smog on a laboratory basis.

As more and more cities come





# CONE

## WITH

## UP

## STEP

You get demonstration of your work and complete job development record

Cone submits samples of your work

Cone makes recommendations

You send print to Cone

No "automatic" user can afford to be out of touch with the latest developments in the use of carbide tools.

The popularity of the Conomatic Carbide Development program has made necessary larger quarters for increased clientele accommodation.

This innovational Cone service is without obligation of machine purchase and is available to users of any brand of multiple spindle automatic.

It costs nothing to know just how profitable your work might be with modern machines, tools, and know-how.

#### DATA FOR COMPARISON

Part.....Spec. Cap Screw	Length.....4 17/32" Cutoff
Machine.....1 1/2" Conomatic	2" Thread
Tools.....100% Carbide Tipped	RPM.....885 Work Spdl.
Material.....8742	580 Th'd Spdl.
Stock Size.....1" Across Flats	1465 Total Eff'd.
	Time.....14 Secs.



# Conomatic

Send for particulars on  
"Four Steps With Cone"

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U. S. A.



under the blight of polluted air, the smog problem gains in political importance. The health of citizens is affected. Farmers in suburban areas stand to suffer costly crop losses. The safety angle figures largely in the picture, as highway accidents mount in smog-shrouded areas.

#### Would Recruit Engineers . . .

Administration science bosses are lining up political support for a new federal program to recruit and train "armies" of young scientific and engineering personnel.

Reason behind the drive is Russia's estimated bumper crop of at least 50,000 trained engineers and scientists each year. Annual U. S. output is fewer than 25,000—less than half the annual Russian output of engineers.

Sen. Norris Cotton, R., N. H., is sponsoring a plan to award government scholarships to prospective engineers and scientists. His plan is beginning to attract the interest of members on both sides of the aisle.

## Foreign Aid:

**Ike wants billions for aid, millions to invest.**

Washington's annual wrangle over how much money the United States should hand out in foreign aid is spiked up this year by two new White House recommendations: (1) President Eisenhower proposes that Congress help create a \$100 million "international development corporation," and (2) Ike separately asks Congress to vote another fund of \$3.5 billion in new overseas aid money.

Both proposals are getting some shrewd inspection on Capitol Hill. Two powerful spokesmen for the majority—Sen. Byrd, D., Va., and Sen. Russell, D., Ga., are flatly opposing any extension of out-right handouts.

#### Limit Investments

The President wants Congress to authorize a subscription of \$35,168,000 to the new finance corporation. With the total \$100 million provided by countries in the free world, the finance corporation

would buy and sell stocks in foreign enterprises as a source of risk capital for these ventures. The funds will not be invested in government projects, and will be withdrawn from the enterprises as soon as private risk capital becomes interested and replaces it.

Finance corporation will operate only in association with private interests which are willing to carry a large share of the total investment in each enterprise, and will "supply the margin of capital needed to attract other funds," the President says.

Congress is also considering the President's request for an additional \$3.5 billion for foreign aid.

## Renegotiation:

**Extend partial exemption to some prime contracts.**

Partial exemption from renegotiation applies to prime contract equipment generally considered productive by industry, but does not include equipment which becomes part of an end product. This exemption was formerly reserved to subcontract productive equipment.

The Renegotiation Board, to clarify the partial exemption to prime contracts, has adopted a new rule defining productive equipment as "equipment sold under a prime contract . . . if it has

## WASHINGTON NEWS

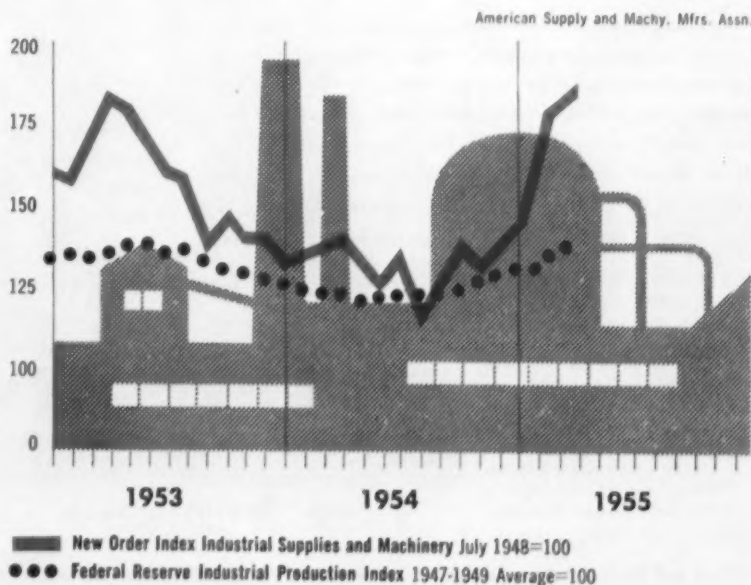
substantial industrial use and its principal industrial use is to produce or otherwise operate directly on materials for sale, or to supply motive power directly to equipment so used."

#### Industrial Use Counts

As an example, the board cites a prime contract sale of air conditioning equipment to the government. Although in rare instances, this equipment might be used to maintain constant temperatures in connection with manufacturing, it is generally to promote comfort and morale of employees; is not exempt from renegotiation.

It is unnecessary, under the new rules, for a contractor to ascertain actual or intended use by the government. Test for exemption from renegotiation for productive equipment is the industry usage.

The board also rules that a subcontract for new durable productive equipment which is incorporated into an end item for sale to the government is not exempt from renegotiation. It cites the case of a motor sold to a prime contractor who installs it in a lathe for sale to the government. The motor is subject to renegotiation, although the lathe is exempt.



# JERVIS B. WEBB

CONVEYOR ENGINEERING, MANUFACTURE, INSTALLATION and AUTOMATION



## SPEED PRODUCTION FROM RAW MATERIALS TO FINISHED PRODUCT WITH WEBB CONVEYORS

Webb conveyor systems speed production and reduce costs in the handling of bulk materials, parts and finished products. For, regardless of material to be handled, Webb manufactures conveyors that will exactly meet every need and Webb engineers have the installation experience to secure highest efficiency.

Here's how a paper mill utilized Webb conveyors and engineering to obtain best possible materials handling throughout their entire manufacturing operation. In the woodyard, a daily supply of thirteen hundred cords of pine logs from four states is unloaded from railroad cars and trucks onto three Webb chain conveyors. Two conveyors take logs directly to the chippers while third conveyor can carry the logs either to the chippers or storage stacker shown above.

This stacker, which is the largest in use today, is approxi-

mately 300 feet long and rises 80 feet in the air. Up to 30,000 cords can be stored by the stacker. Additional chain, belt, drag, screw and apron conveyors automatically perform such functions as: removing chips from storage bins, carrying chips to digester, and conveying bark to storage or boiler house. Even coal from railroad cars is carried on conveyors to the crusher and then automatically distributed to the boilers.

Within the mill a Webb conveyor system handles rolls 6 feet in diameter and 10 feet long. These rolls, which weigh 10,000 pounds, are carried on roller flight conveyors and slat conveyors from cutting and gluing to banding and weighing. Also, through use of a selector mechanism, finished rolls are sent either to storage or to a slat conveyor located on the shipping dock.

4463

Write to us on your company letterhead and we will be happy to place your name on the Webb mailing list to receive factual technical information on conveyor installations, case history reports, and new product literature.

## JERVIS B. WEBB CO.

*Specialists in Custom Conveyor Systems*

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Offices and Representatives Throughout The World • FACTORIES: Detroit • Los Angeles • Hamilton, Ontario



## West Industrial Growth Continues

**Atlas puts millions into Utah uranium mills . . . Expansion comes from new companies, western divisions of established firms . . . Industry diversifies from heavy to consumer goods—By R. R. Kay.**

♦ **NEW AND** expanding companies all over the West are beefing up the area's economy. These companies are building more muscle in metalworking here—their needs in products and services make them hot prospects for materials and equipment produced throughout the country.

Atlas Corp. plans a \$15-\$25-million expenditure for uranium mills at two of its Utah subsidiaries. . . United Fabricators, Inc., went into business in Seattle to make metal hotel and restaurant equipment. . . Kilpatrick, Inc., will make stair treads, steel grating and flooring in Portland, Ore.

**Diversified Products . . .** Utah Power & Light Co. completed a \$16-million unit of its Salt Lake City steam electric plant. . . Impe-

rial Machine Co. will make aircraft parts in a new Hawthorne, Calif., plant.

Newport Products Co., Portland, Ore., will manufacture motorized golf carts. . . Sierra Pacific Power Co., Reno, Nev., earmarked over \$3 million for expansion during 1955. . . Rare Metals Corp. of America expects to put up a mercury recovery unit at Weiser, Idaho, to handle 175 tons per day.

Helipot Corp., instrument manufacturers, will build a \$2-million plant at Newport Beach, Calif. . . Linde Air Products Co. will make liquid oxygen in its Seattle plant. . . Safe-Lad Mfg. Co., Portland, Ore., will produce mobile ladder trucks. . .

Portland's Pacific Northwest Power Co. got a Federal Power Commission permit to look into

two hydroelectric power sites. Proposed projects, on the Oregon-Idaho border, would give the power-hungry Pacific Northwest another 850,000 kw capacity.

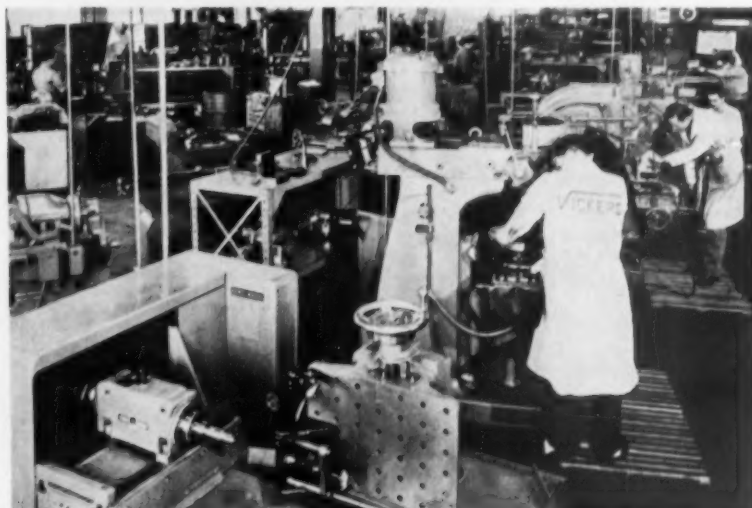
Trac-Turner Mfg. Co., Portland, Ore., will turn out sawmill machinery. . . Super Tool Co., Detroit and Elk Rapids, Mich., is now turning out carbide cutting tools in a Glendale, Calif., plant. . . Coast Foundry & Mfg. Co., La Verne, Calif., is erecting a new plant to make brass plumbing goods.

**New Plants . . .** Turco Products, Inc., Los Angeles, plans a new 39,000-sq-ft Wilmington, Calif., plant for production of its chemical processing compounds. . . Boyer Sheet Metal & Heating Co., San Lorenzo, Calif., is building wing.

Ferguson Scale Co., Oakland, Calif., is moving to a new plant to manufacture industrial scales. . . Ultra-Violet Products, Inc., will expand its production of ultra-violet lights, for industrial, prospecting, and display use, in a remodeled San Gabriel, Calif., plant.

Thermador Electric Mfg. Co., Los Angeles, maker of electric ranges and heaters, plans a new research and development laboratory. . . Barr Mfg. Co., Oakland, Calif., is expanding its facilities for refrigeration equipment.

Wayne Mfg. Co., Pomona, Calif., is adding space to handle its industrial sweeper production. . . J. Schwartzman Mfg. & Supply Co., North Hollywood, Calif., plans more square footage for manufacture of threaded products. . . Western Metal Sash Co., Castro Valley, Calif., will make aluminum window sash in a new plant.



**EXPANSION** of Vickers facilities at El Segundo Div., Los Angeles, permits design and manufacture of hydraulic valves for airborne use. Aircraft products will take about 75 pct of plant production.



**PAY-OFF PRICE ONLY 27 CENTS PER HOUR...**  
 when you put this new 7½ hp No. 3 Model CE plain  
 milling machine to work in your plant with...

## Kearney & Trecker

# TOOL-LEASE

## PROGRAM

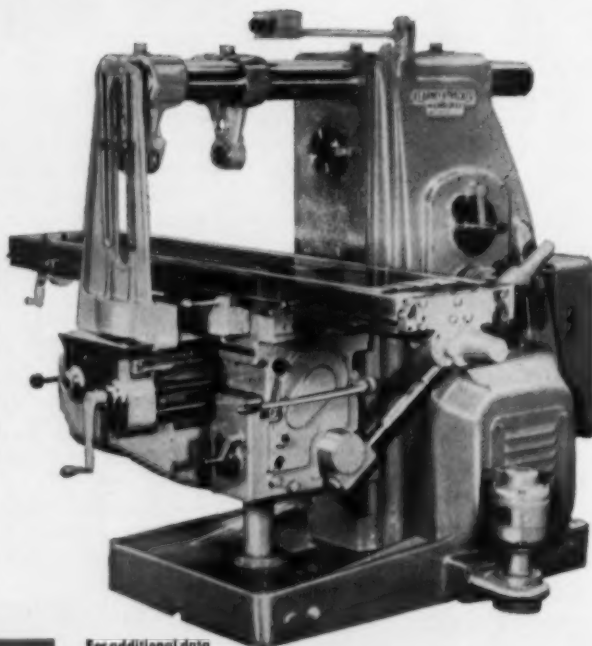


**I**T's true! Under Tool-Lease you can lease this new 7½ hp No. 3 Model CE plain milling machine for *only 27 cents per hour*. This Model CE is Kearney & Trecker's answer to industry's need for a milling machine that combines *quality and low initial cost* with efficiency, ease and economy of operation.

Under Plan "A," one of three possible lease agreements, you make two semi-annual payments, totaling 25% of the machine's price during each of the first three years. And only 10% during each of the last four years.

What's more, under Tool-Lease you can rent any of over 250 different types and sizes of standard milling machines or precision boring machines. All are available under three basic plans, with varying options to continue or terminate the lease, or to purchase the equipment. If you require special machinery or heavy-duty CSM bed types, special agreements will be considered.

For complete information on Tool-Lease, see your Kearney & Trecker representative or mail coupon to Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.



For additional data on this machine, see our catalog in Sweet's.

**MACHINE TOOL OBsolescence IS BECOMING CRITICAL WHERE DO YOU STAND?**



**Fabricated Metal Products Industry** — Includes machines for hand tools; hardware; oil burners; structural steel; boilers, sheet-metal, enameled, stamped and pressed metal products; powder metallurgy; wirework; screw-machine products; metal specialties, games, toys, jewelry, and sporting goods. Of the total 20,583 machines, 18% are over 20 years old and over 36% are 10 to 20 years old.



Machines over 20 years old, which should definitely be replaced.

Machines 10-20 years old, which should probably be replaced.

Machines less than 10 years old.

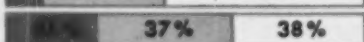
3987 automatic and manufacturing type milling machines



5143 vertical milling machines



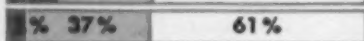
9573 knee type horizontal milling machines



1009 bed type milling machines



871 horizontal and vertical precision boring machines



Figures adapted from 1953 American Machinist survey of Metalworking Industry.

**KEARNEY & TRECKER CORP.**  
 6784 W. National Ave., Milwaukee 14, Wis.  
 Please send me Bulletin TL-10A on Tool-Lease Program and booklet titled "Critical Picture of Creeping Obsolescence."

Name \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_





## Machine Tool Show Interest Mounts

**"Three-ring production circus" will show machine savings and obsolescence hazards . . . NMTBA urges early action on machine shipments, room reservations . . . Gear index up 16.4 pct—By E. J. Egan, Jr.**

◆ SHOW plans are "proceeding on schedule." The giant National Machine Tool Show, to be held in Chicago, Sept. 6 through 17, is taking shape. Members of the National Machine Tool Builders Assn. got this reassuring word last week at their annual spring meeting in the same city. Welcome news was delivered by William E. Rutz, executive vice-president of Giddings & Lewis Machine Tool Co. and chairman of the show committee.

Builders' interest in the show, heightened by the short time remaining for firming up final plans, took precedence over most of the regular proceedings at the 3-day convention.

Members of the show committee even moved out of official hotel headquarters to conduct their scheduled conference. They journeyed across town to Chicago's International Amphitheater for a tour of the show site and a luncheon meeting.

Mr. Rutz' formal report to a general session of NMTBA members warned that a few problems still remain in connection with the Show, largest of its type ever planned for the U. S.

**Weight Poses Problems . . .** He said that the enormous size and great weights of some of the machinery to be installed poses difficulties never before experienced by show planners. Lack of skilled riggers and movers makes it imperative for builders to see that their equipment arrives at the show site on assigned target dates.

Next, the chairman emphasized

the "show" aspect of this year's 12-day display. He said, "We are not simply building new models to be exhibited; we are not merely getting our best merchandise ready to be seen. We are putting on a 3-ring productivity circus."

The show's success will depend on the number of people who come to see it, Mr. Rutz continued. He told his fellow builders, "Our major job right now is . . . selling the right kind of people on the necessity of visiting our show."

**Stress Machine Savings . . .** The economic hazards of machine tool obsolescence and the cost-cutting potential of modern metalworking equipment will be stressed by all show exhibitors. For this reason Mr. Rutz urged his audience of machine tool executives to arouse interest and stimulate curiosity about the show among their cus-

### GEAR INDEX 1955

	25	50	75	100	125	150	175	200	225
JAN									140.9
FEB									148.5
MAR									172.2

Base: 1947-49 = 100

Source: American Gear Manufacturers Assn.

tomers. He told them the best way to do this is by making personal calls.

He said, "We must make the people who are responsible for cost reduction, in every company we sell or hope to sell, aware that they are neglecting a vital responsibility to their company unless they come to the show and see ways and means by which cost per piece can be reduced."

Government executives, whose duties concern machine tools and overall defense production, have expressed keen interest in the show, Mr. Rutz stated. He said that NMTBA president M. A. Hollengreen, and Ralph Baldenhofer, director of Business and Defense Services Administration's metalworking equipment division, had already called on many government officials to issue invitations.

**Get Rooms Soon . . .** Metalworking industry executives planning to visit the show this September would do well to make their hotel reservations now. Tip-off came when Mr. Rutz told builders that the Chicago Convention Bureau reported thousands of hotel rooms already assigned.

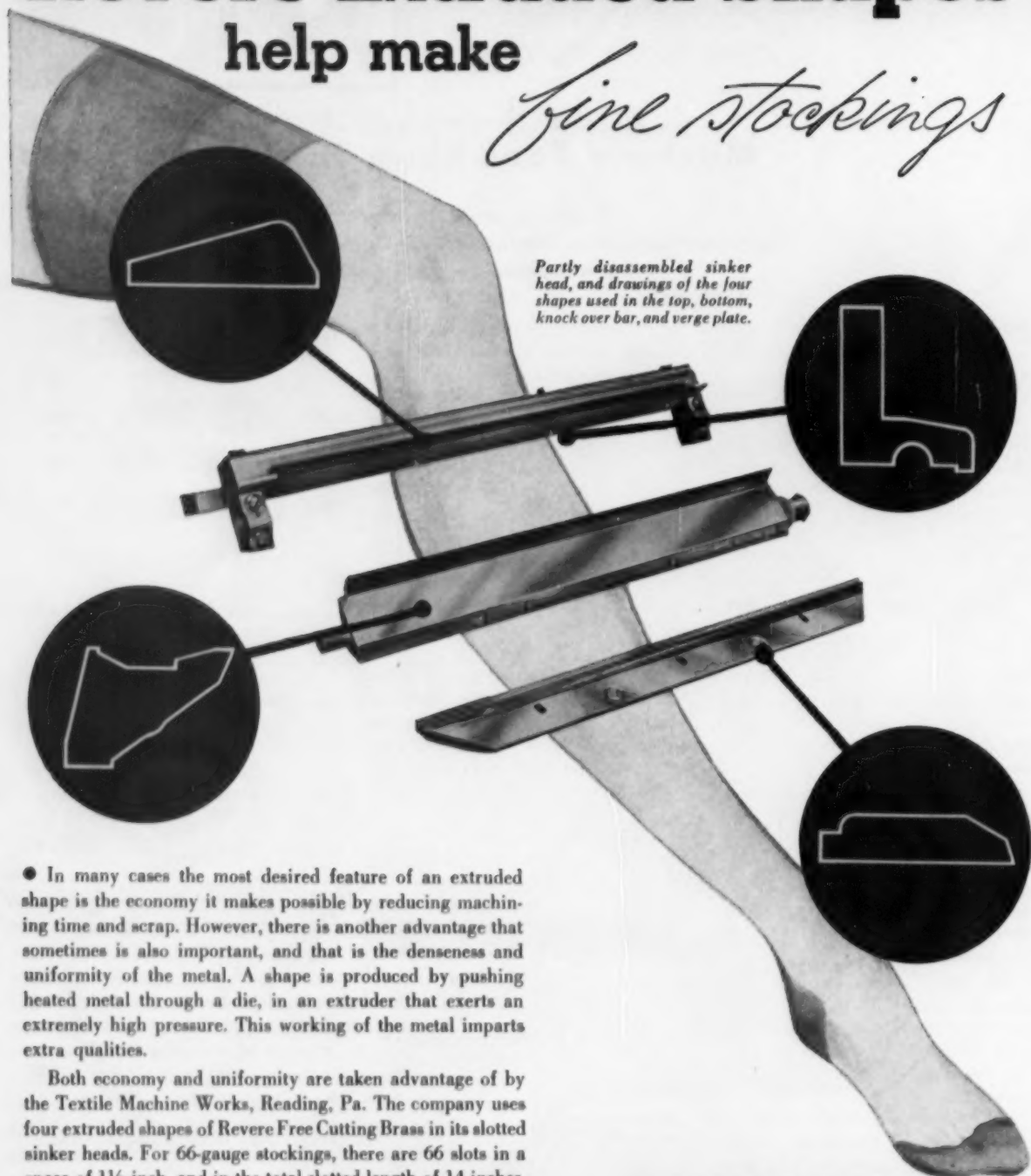


"All right, all right—I'll marry you."

# Revere Extruded Shapes

help make

*fine stockings*



Partly disassembled sinker head, and drawings of the four shapes used in the top, bottom, knock over bar, and verge plate.

● In many cases the most desired feature of an extruded shape is the economy it makes possible by reducing machining time and scrap. However, there is another advantage that sometimes is also important, and that is the denseness and uniformity of the metal. A shape is produced by pushing heated metal through a die, in an extruder that exerts an extremely high pressure. This working of the metal imparts extra qualities.

Both economy and uniformity are taken advantage of by the Textile Machine Works, Reading, Pa. The company uses four extruded shapes of Revere Free Cutting Brass in its slotted sinker heads. For 66-gauge stockings, there are 66 slots in a space of  $1\frac{1}{2}$  inch, and in the total slotted length of 14 inches, the tolerance is less than .001 inch. In order to achieve this accuracy, and be assured of straightness and flatness, Textile specifies shapes of extreme uniformity.

Perhaps your requirements are not quite so high as Textile's. Or perhaps they are higher. In either case, we shall be glad to explain how Revere Extruded Shapes can save you money, and at the same time help you maintain the highest quality standards. See the nearest Revere Sales Office.

**REVERE**  
**COPPER AND BRASS INCORPORATED**

*Founded by Paul Revere in 1801*

230 Park Avenue, New York 17, N. Y.

*Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.;  
Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.—  
Sales Offices in Principal Cities, Distributors Everywhere.*



## The Iron Age

## SALUTES

**Thomas Mellon Evans** He has taken up some of the slack in our economy by bringing dash and cash to faltering companies and demonstrating that rapid progress is necessary for industrial survival today.

A recent one-day itinerary had Yale graduate and one-time oil company clerk Tom Evans attending meetings in Pittsburgh, Detroit, Cleveland and Buffalo. If this suggests fast motion, it isn't misleading. President of H. K. Porter Co., Inc., Pittsburgh, Tom travels in strides that dazzle financial experts and leave secretaries limp.

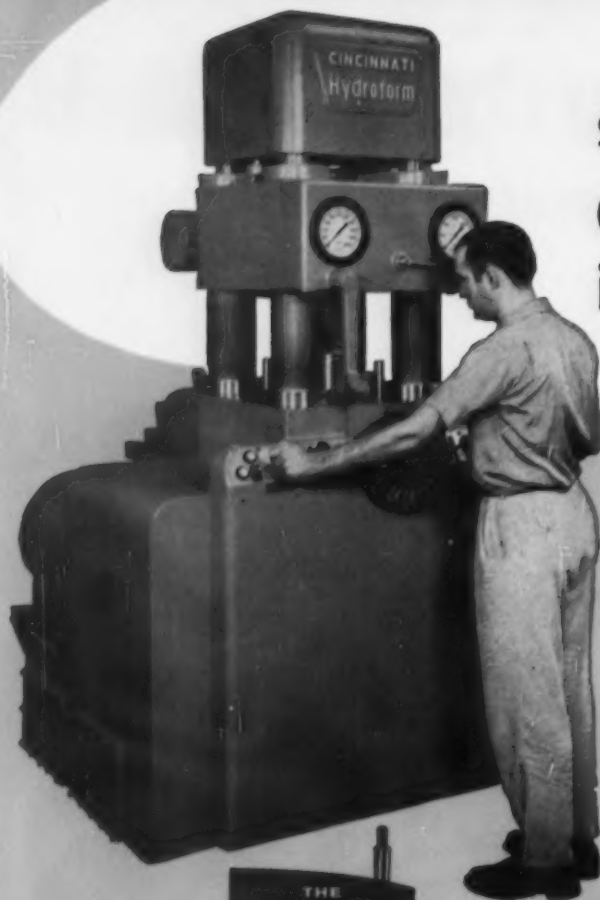
Tom became head of H. K. Porter in 1939. The company had one product, steam locomotives, and had just gone through financial reorganization. Today Porter interests take in over \$80 million a year. A growing number of divisions turn out steel, copper, refractory and other products.

Tom's formula for growth is to buy and build. He will buy a sound company that is just plugging along and restore competitive strength by injecting fresh capital and drive. "If you stand still, you are actually falling back," he says. He believes smaller concerns must expand to stay alive and he sees acquisition of potentially strong companies as good growing medicine.

Tom's theories were put to test in 1945 when it was decided to diversify Porter's product lines. Moderate success marked the first moves but the 1949 acquisition of Quaker Rubber Corp., Philadelphia, really started things rolling. Over \$3 million in new equipment went into the Quaker division and a similar concern, Pioneer Rubber Mills, was subsequently acquired.

Delta-Star Electric Co., Chicago, was added in 1950 along with Connors Steel, Birmingham. Two million dollars were put into new Connors facilities. Since then the expansion wave has moved with a rush. Last year alone five separate companies were acquired. Tom frankly admits he is in the market for new properties but he makes it clear he is building, not liquidating; strengthening, not swallowing.

Tom was recently honored by the Newcomen Society of North America. He is married and has three children. He has a home in Greenwich, Conn., is a distant cousin of financier, Andrew Mellon, travels a lot by private plane.



small size producer  
of **BIG SIZE SAVINGS**  
in metal forming . . .

## The New Cincinnati 8" Hydroform

The new Cincinnati 8" Hydroform duplicates the performance of its larger family members—the 12", 19", 23", 26", and 32" size machines—by producing a wide variety of deep drawn parts . . . with lower tooling costs . . . at a faster rate . . . and with higher standards of quality than is possible to obtain by other methods.

And it takes up less plant floor space than some soft drink dispensing machines occupy.

Typical examples of work formed on the 8" Hydroform are shown at left. Listed below is a table of major machine specifications.

If your manufacturing requires the production of drawn shapes in small lots—or extensive development work prior to quantity production—let a Cincinnati Milling field engineer show you how the many Hydroforming advantages can be profitably applied to your work. For a description of the Hydroforming process and specifications of the six machine sizes, write for Bulletin M-1759-3.

#### Work Capacity:

Maximum Blank Diameter—8"  
Maximum Draw Depth—5"  
Maximum Blank Gauge— $\frac{1}{4}$ " Steel  
Maximum Forming Pressure—15,000 psi

#### Machine Operating Rate:

Maximum—200 cycles per hour

#### Dimensions:

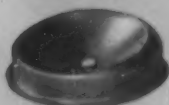
3' x 5' x 7  $\frac{1}{2}$ ' high

#### Weight:

Machine Net—12,000 lbs.

#### Installation:

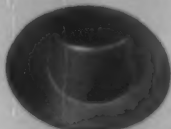
Floor Mounted. Requires water and electrical connections.



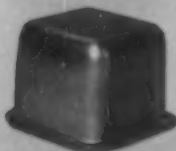
Reflector of .020" Aluminum, drawn, pierced and trimmed in one operation.



Electrical Detail of .042" stainless steel, drawn in two operations.



Jet Engine Detail of .032" Inconel, drawn with flange on an angle with the balance of the part in one operation.



Cover of .060" 250 Aluminum, drawn in one operation.

# Hydroform

PROCESS MACHINERY DIVISION  
**THE CINCINNATI MILLING MACHINE CO.**  
CINCINNATI 9, OHIO, U. S. A.





## The Iron Age INTRODUCES

**R. H. Godeke**, manager, Allis-Chalmers General Machinery Div., Corpus Christi.

**J. J. Hill**, appointed manager of Carolinas district, Westinghouse Electric Corp. **H. E. Nason**, named Chicago district engineering manager, and **Richard D. Borgstadt** named as application engineering manager.

**Vaux H. Adams**, named assistant district manager, Firth Sterling, Inc., Detroit.

**H. L. Guthrie**, appointed assistant director of purchases, American Bridge Div., U. S. Steel Corp.

**William E. Clark, Jr.**, will head the newly created sales promotion and advertising activities, and **Chalmer Adams** will head public relations, American Welding and Manufacturing Company, Warren, Ohio.

**Donald F. Konrad**, appointed sales representative, Steel Strapping Div., The Stanley Works, St. Louis, Missouri.

**William R. Morrissey**, appointed sales representative — Chicago, Wolverine Tube.

**Jack H. Rolfe**, named resident salesman in the newly created field office in Toledo, Ohio, Crucible Steel Co.

**H. Wynn Gethin**, district sales manager, LaCled-Christy Co. division of **H. K. Porter Co., Inc.**, Pittsburgh.

**Roy L. Leventry, Jr.**, named division superintendent, Maintenance and Utilities Div., Fairless Works, United States Steel Corp. Other appointments were **Charles F. McClurg**, assistant division superintendent, **Charles W. Dunn**, utilities superintendent, **Jack E. Webber**, assistant superintendent of utilities, and **Luther W. Eisenhart**, general foreman of fuels and instruments.

**Albert H. Shonkwiler**, appointed general manager, Steubenville Works, Wheeling Steel Corp. Other appointments were, **L. H. Brown**, assistant vice-president, **G. P. Hanse**, assistant vice-president, **H. B. Scott**, assistant vice-president, **M. E. Marsh**, assistant vice-president, **N. W. Hocking**, assistant treasurer, **G. T. Welsh**, assistant treasurer, **J. G. Hutchinson**, assistant comptroller, **W. W. Saunders**, assistant comptroller, **A. H. Bowman**, assistant secretary and **J. E. Bruce**, assistant general counsel.

**Charles W. Mooney**, appointed superintendent, Link - Belt Co. foundry in Philadelphia. He succeeds **William A. Morley**, who becomes general superintendent of the Link-Belt plant in Philadelphia.

**William F. Wahlenmaier**, appointed Portland branch manager, Fairbanks Morse & Co.

**Burton N. Wright**, promoted to St. Louis District sales manager, LaCled-Christy Co., division of **H. K. Porter Co., Inc.**

### PERSONNEL



**RALPH D. PARKER**, elected vice president, The International Nickel Co. of Canada Ltd.



**WALTER A. McCADDEN**, elected comptroller, International Nickel Co. of Canada, Ltd.



**WILLIAM W. EGE**, elected director, Copperweld Steel Company, Pittsburgh.



**DR. IRVING A. OEHLER**, named manager-manufacturing, The American Welding and Manufacturing Co., Warren, Ohio.

**William Coleman**, manager of industrial relations, Highland Park Mfg. Div., Chrysler Corp., Detroit.

**Chris H. Bartlett** and **Charles C. Shutt**, named vice-president, Westinghouse Electric Corp., Pittsburgh.

**William H. Cook**, appointed assistant sales manager, Steel Strapping Div., The Stanley Works, New Britain, Conn.

**Norman J. Hoenie**, appointed chief engineer, machine division, and **Emmett Smith**, chief engineer, electrode division, The Lincoln Electric Co., Cleveland.

**Dr. William J. Harris**, appointed assistant to the director, Battelle Memorial Institute, Columbus, Ohio.

**Herbert Steinkamp**, named manager of the builder sales dept., and **Louis D. Stull**, manager of steel kitchen sales, Republic Steel Kitchens, Canton, O.

**John Van Wagoner**, moved to the Advertising Dept., Wolverine Tube Div. of Calumet & Hecla, Inc.

**John J. Green**, named service engineer, Pittsburgh office, Vanadium Corp. of America, Pittsburgh.

**Burnell L. Verner** and **J. L. Gordon**, elected vice-presidents, Luria Brothers & Co., Inc.

**George Lee Berry**, named chief engineer, Jones & Laughlin Steel Corp., Pittsburgh.

**Thomas J. Moore**, resident salesman for the Chattanooga area and state of Georgia, Solar Steel Corp.

**Charles Bultman**, named to promotion of sales of new blast equipment, Pangborn Corp. **David Bair** succeeded Mr. Bultman as manager of the Detroit district. **Robert Treglown** is now a sales engineer in the Detroit district and **C. H. McKinsey** has been named sales manager in the Detroit office.

**Robert W. Marvin**, named general manager, Dravo Corp.'s, Engineering Works Division, Pittsburgh.

**Elmer W. Niskala**, appointed general sales manager, Borroughs Mfg. Co., Kalamazoo, Michigan.

**John M. Wilson**, named chief engineer, development and design div., engineering department, Brown Instruments Div., Minneapolis-Honeywell Regulator Co.

**Eliot V. Parker**, named chief of safety div., U. S. Department of Labor, Bureau of Labor Standards.

**M. J. Ross**, named manager, export trade, Quaker Rubber Corp. and Watson-Stillman Co. Divisions of H. K. Porter Co., Inc., New York.

**H. L. Stockdale**, appointed president, Insul-Mastic Corp. of America, Pittsburgh.

**John H. McElhinney**, named vice-president in charge of operations, Wheeling Steel Corp., Wheeling, W. Va.

**Robert G. Page**, appointed manager, Maspeth plant, General Electric's distribution assemblies dept., Plainville, Connecticut.

**R. T. Nalle**, named president, The Midvale Co., Philadelphia. Others elected were **L. W. Metzger**, executive vice-president, **Howard H. Case**, vice-president—sales, **A. O. Schaefer**, vice-president, **Lloyd R. Loewen**, secretary and treasurer, and **Walter H. Lewis**, assistant secretary and assistant treasurer.

**William A. Steele**, elected vice-president—operations, Wheeling Steel Corp., Wheeling, W. Va.

**Harold M. Schudt**, president, Canadian Allis-Chalmers Ltd., Montreal, Quebec.

**John Bermingham**, western sales manager, E. F. Houghton & Co., Philadelphia.



**FRANK J. KEARNS**, elected vice president-manufacturing, Bridgeport Brass Co., Bridgeport, Connecticut.



**KERMIT L. JOHANNSEN**, appointed assistant to vice president-operations-steel, U. S. Steel Corp., Pittsburgh.



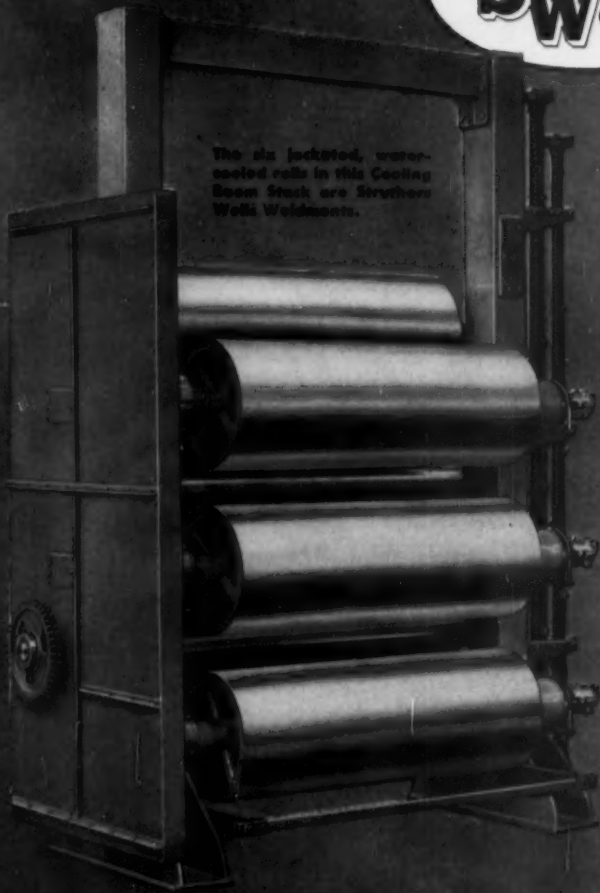
**ROY L. LEVENTRY, JR.**, named superintendent of Utilities Division, Fairless Works, U. S. Steel Corp., Morrisville, Pa.



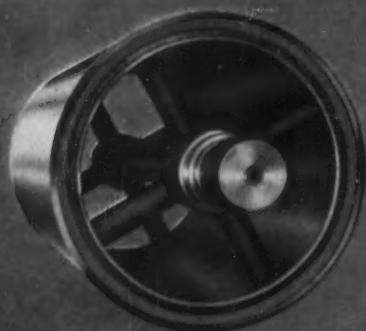
**EDWARD D. PORTER**, appointed manager, electric furnace plant, Norton Co., Huntsville, Alabama.



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**Joseph F. Hutchinson**, appointed manager of the Automotive Engineering Div., **Goodyear Tire & Rubber Co.** **J. C. Tuttle**, named consulting engineer for the division, and **Gene C. Huffman**, superintendent of the Metal Products Division.

**Charles B. Sanborn** has joined the electroplating section, Development and Research Div., **International Nickel Corp., Inc.**

**E. M. Detwiler**, works manager, **Lake Erie Engineering Corp.** Others appointed were **William H. Bennett**, sales manager, **Robert J. Fuller**, assistant treasurer, and **Robert W. Gerhardt**, sales project engineer.

**G. H. Schryver**, named materials handling engineer by **Wheeling Steel Corp.**, and **Carl D. Burkland**, appointed chief industrial engineer.

**Dr. George W. Lewis, Jr.** and **Howard S. Ring**, research chemists, joined the staff of **Climax Molybdenum Co.**, in Detroit.

**Frank L. Marshall**, named sales manager, Tool Div., **Utica Drop Forge & Tool Corp.**

**Jack N. Yetter**, appointed sales manager, General Products Div., **Twin Disc Clutch Co.**

**Folke W. Anderson**, appointed assistant plant manager of the **National Can Co.**, Kedzie plant, Chicago.

**Dr. William A. Johnson**, named to head the activities for the new laboratories to be erected by **Thompson Products, Inc.**, in Tapco plant, Euclid, Ohio.

**William F. Wahlenmaier**, appointed Portland branch manager, **Fairbanks Morse & Co.**



**COLONEL J. S. ERVIN**, named director and member of executive committee, **E. W. Bliss Company**, Canton, Ohio.



**J. R. PATTERSON**, vice president—**Mackintosh-Hemphill Div.**, **E. W. Bliss Co.**, Canton, Ohio.



**R. C. MAHON**, elected chairman of the board, **R. C. Mahon Co.**, Detroit.

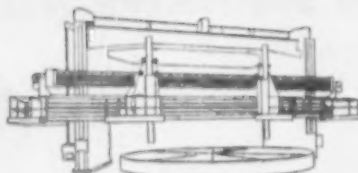


**WALTER H. CREBER, JR.**, elected vice president-sales, **Chicago Steel Service Co.**, Chicago.

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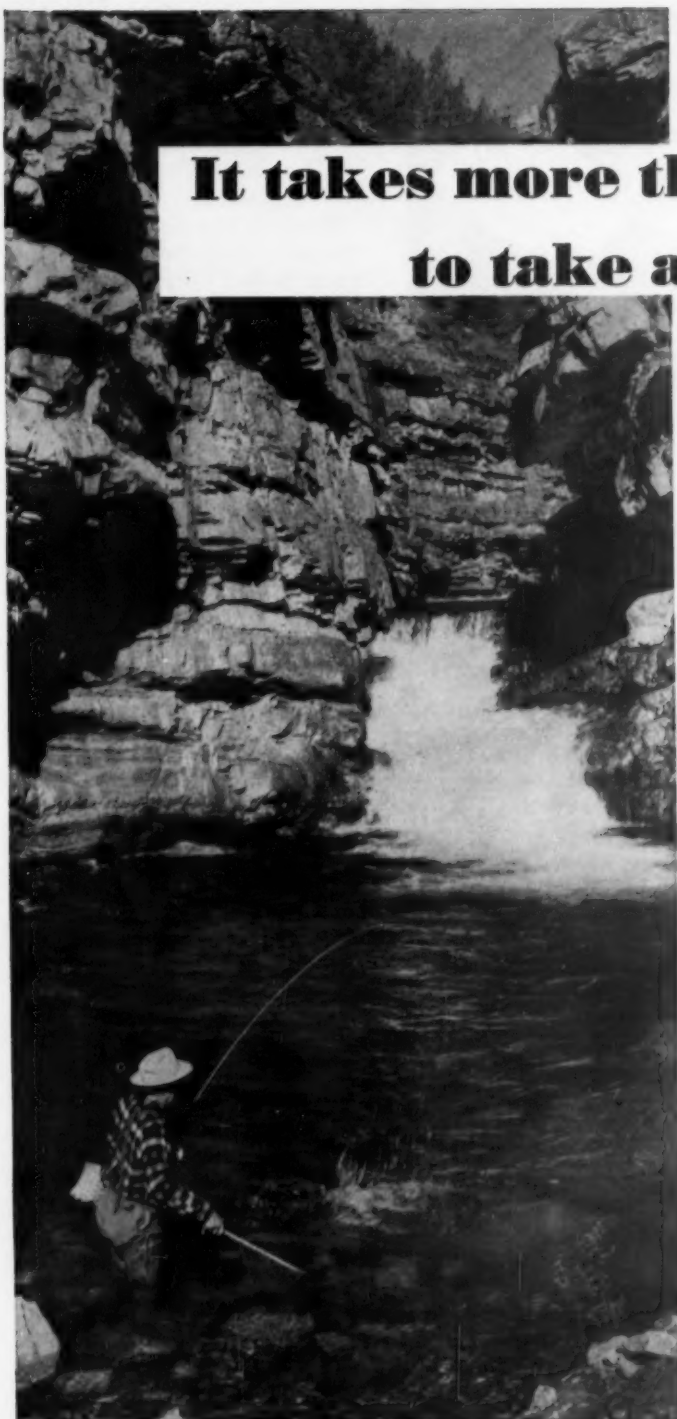


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## PERSONNEL

**Dr. George W. Lewis, Jr.** and **Howard S. Ring**, research chemists, joined the staff of **Climax Molybdenum Co.'s** Detroit laboratories.

**Frank L. Marshall**, named sales manager, Tool Div., **Utica Drop Forge & Tool Corp.**

**Jack N. Yetter**, appointed sales manager, General Products Div., **Twin Disc Clutch Co.**

**Folke W. Anderson**, appointed assistant plant manager of the **National Can Co.**, Kedzie plant, Chicago.

**Charles Bultman**, named to promotion of sales of new blast equipment, **Pangborn Corp.** **David Bair** succeeded Mr. Bultman as manager of the Detroit district. **Robert Treglown** is now a sales engineer in the Detroit district and **C. H. McKinsey** has been named sales manager in the Detroit office.

**Dr. William A. Johnson**, named to head the activities for the new laboratories to be erected by **Thompson Products, Inc.**, in Tapco plant, Euclid, O.

**Charles W. Mooney**, appointed superintendent, **Link-Belt Co.** foundry in Philadelphia. He succeeds **William A. Morley**, who becomes general superintendent of the Link-Belt plant in Philadelphia.

## OBITUARIES

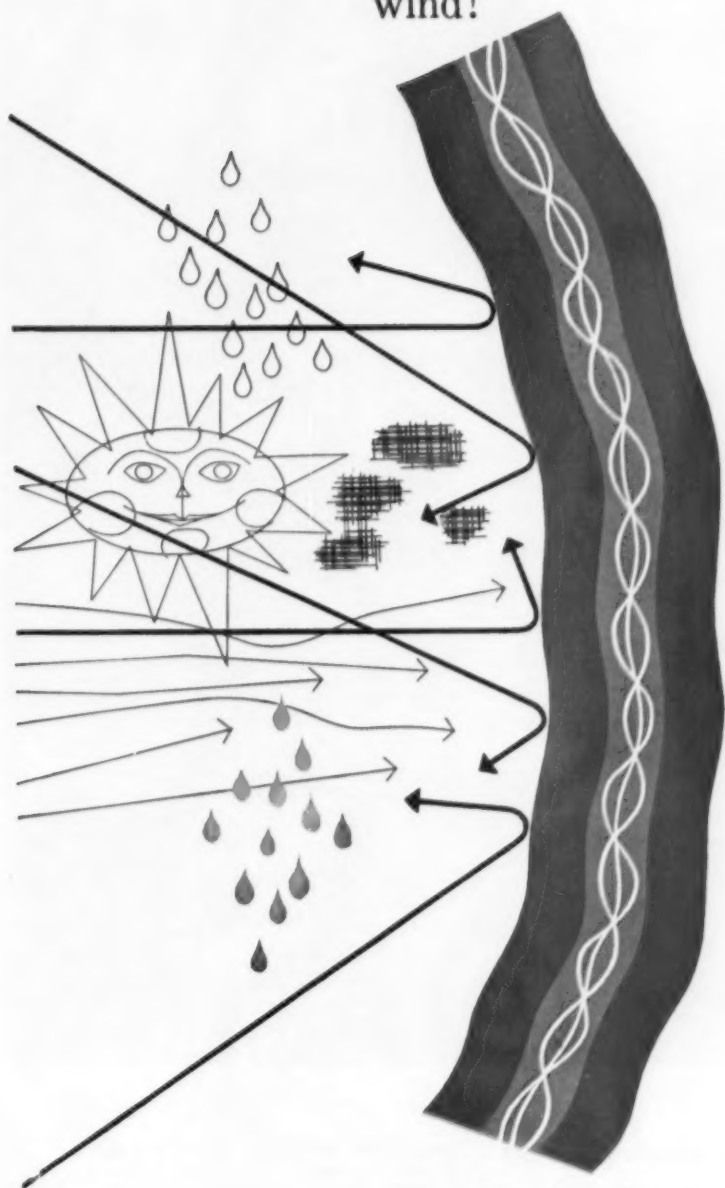
**Walter C. Baker**, 87, founder of **Baker-Rauland Co.**, Cleveland.

**John M. Cook**, 60, pioneer in abrasives industry, Johnsonville, N. Y.

**Cameron B. Waterman**, 76, inventor of outboard motor, Detroit, Michigan.

**F. J. Peters**, vice president of **National Automatic Tool Company**.

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May 12, 1955

93

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TECHNICAL  
ARTICLES

**Greater payloads—**

## **Proper Handling Devices Aid Batch Pickling**

By **W. A. RISHER**, Manager,

Inco Nickel Products,  
Williams and Co., Pittsburgh

♦ Pickling equipment must have high strength-to-weight ratios, superior resistance to acids . . . Well-designed, corrosion-resistant equipment simplifies work handling and permits greater payloads.

♦ Carriers have been developed for all common pickling work . . . Many are available ready-made from manufacturers . . . Others are specially fabricated for unusual jobs.





**CHAINS** of 326 Monel have been carrying plate through pickling bath in shipyard for ten years.

◆ **SLING CHAINS**, hooks and fabricated carriers used in batch-type pickling operations must have a high strength-to-weight ratio (for greater payloads), and superior resistance to acid solutions. They must also be able to withstand alkali cleaning baths. For these reasons many handling devices, for everything from billets and blooms to small screws and rivets, are fabricated from various nickel alloys.

To eliminate useless and costly machining of faulty parts, forgings are often pickled and carefully inspected beforehand for defects. The heavy, irregularly shaped parts are batch pickled in rugged baskets which are generally custom built for the pickling department's needs. The baskets are commonly made of perforated sheet and fitted with lifting hooks or with trunnion pick-up for easy tilting and dumping.

Similar baskets may be used to pickle cast parts. These, however, are pickled in hydrofluoric acid or mixed solutions to remove surface sand harmful to cutting tools in machining.

#### **Design special crates**

For larger forgings and castings, slings, chains and hooks are used.

Heavy fabricated products are usually handled in specially designed crates. Here the use of strong, light, easily fabricated materials gives the designer an opportunity to improve equipment so that work handling can be simplified and operating costs reduced.

Small stampings, forgings, nails, bolts and many other small steel products often require pickling to prepare them for plating or other finishing steps. Most of these products are batch pickled in perforated drums or dipping baskets.

The drums, usually fabricated from sheet and bar, may be either manually operated or motor-driven. Dipping baskets for pickling small parts by hand are available in a multitude of different design in wire mesh, perforated sheet, and even expanded metal.

A clean surface is the starting point for

enameling, tinning, galvanizing, lacquering and similar finishing processes. For hollow ware and bulky products, ranging from kitchen pots and pans to large industrial equipment parts, specialized baskets and small crates are most commonly used.

Very often their design permits movement in the bath to insure proper pickling of all surfaces as well as complete drainage before unloading. Both trunnion type pick-ups and light chains may be used for this purpose.

By using expanded metal for the sides and tops, some users get very light baskets and quicker drainage without sacrificing any essential strength. The expanded sheet is often used as separators between work pieces in the basket.

For deep drawn products, which must be annealed as well as pickled, the baskets may be made from a nickel alloy which combines heat resistance with the required strength and corrosion resistance.

The time-proved way to handle steel rod, bar, pipe and tubing in the pickle bath is with sling chains. Toughness as well as strength is a desirable property in material for sling chains, to enable them to handle heavy loads safely and guard against sudden breaks.

#### **Spreaders prevent bunching**

Spreaders or cradles may be used in the bottom of pickling tanks to prevent bunching of the work load and to expose the work uniformly to the pickling solution.

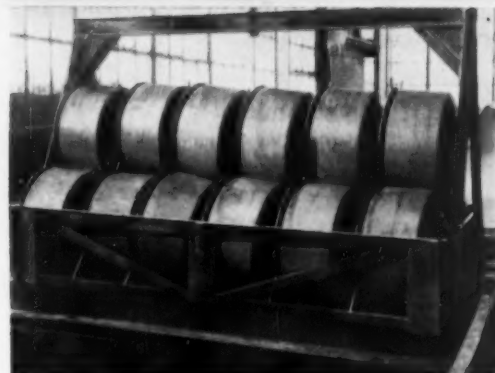
In some operations, crates with separators or combs instead of sling chains are used to hold rods and bars.

Mechanized equipment is now available which raises and lowers the work on special chains to produce agitation. In some of these mechanical picklers, eccentric sprockets create an uneven lifting motion so that tube or pipe interiors are also well flushed with the solution. These methods reduce the time a load must remain in the pickling bath as much as 40 to 60 pct.

Since the sizes and thicknesses of steel sheets vary considerably, batch pickling equipment designs must allow flexibility in loading. A specialized type of crate with tapered holes in its cross members is most frequently used. The holes seat pickling pins which hold the sheets in a near upright position and divide the load into loosely positioned batches. Individual sheets are separated by wire hairpins. To save weight, the pickling pins are sometimes made of heavy wall seamless tubing.

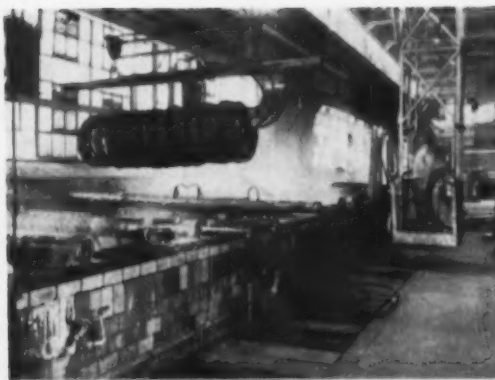
Crates of this kind can be adapted to either work agitation or solutions agitation, merely by changing the pick-up arrangements to accommodate chains, eye-bars, etc.

When coiled strip is batch pickled, it is usually loaded flat on grid-like crates. A second type of operation uses yoke picklers. Here a bar is slipped through the center of one or more coils to suspend them upright in the solution. In this way coils of varying widths are pickled together.



Top: **HOLLOW WARE** basket of expanded sheet combines light weight and long life.

Bottom: **STEEL CRATE** in service 20 years carries steel drums through sulphuric acid bath.



Top: **CAPACITY** of 18-ft, 326 Monel hairpin hook for handling coiled wire is 6000 lb.

Bottom: **ECCENTRIC** sprockets in this mechanical pickler tilt load for agitation and drainage.

Batch pickling sheared lengths of strip is usually done with pickling combs which hold the individual lengths of strip upright on the crate. Several tons can be built up, by adding layers.

When straight lengths are batch pickled with regularity, the use of comb racks may simplify handling. The comb rack is simply a pair of pickle combs combined with a lifting device to make a single, easy-to-handle carrier.

In many large pickling departments, hooks of the hairpin (open-ended) type are widely used for wire in coil because they reduce work-handling time. These hooks carry loads as much as 6300 lb per lift and must be able to stand the bending forces with a big safety factor.

Billets, blooms and plate are usually carried through the pickling cycle in massive sling chains. A sudden failure could mean wasted production, lost man-hours, and possibly a damaged tank as well. To avoid these failures, most large pickling departments now use chains which have high ductility as well as strength. Ductility is valuable in chain material because it permits a link to "give" rather than snap off on over-load.

Continuous pickling processes have eliminated batch pickling operations in many manufacturing plants. These newer methods can process thousands of parts per day, both simplifying and

speeding up this step in manufacture of many parts.

The amount of equipment involved is extensive and covers many types of conveyor chains, carrier hooks, baskets, rotating drums and fastenings. Corrosion resistant material is, of course, required where the equipment is exposed to alkaline baths, pickling solutions, washing and drying cycles and plating solutions.

Most types of wood tank construction depend upon metal tie rods to keep the tank tight and leak-free throughout its useful life. Material for the tie rods must have high tensile strength so that rods can take the strain of swelling wood and occasional retightening. The tie rod material must also have sufficient corrosion resistance to last at least the life of the tank.

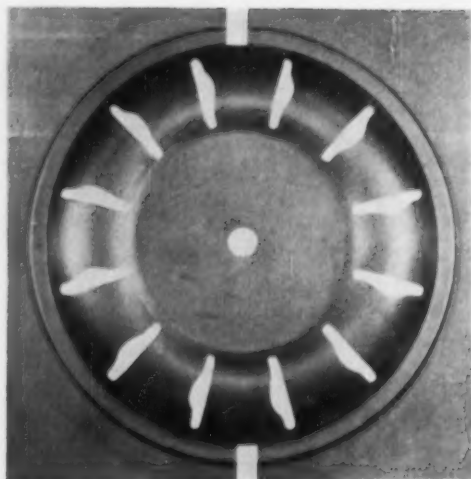
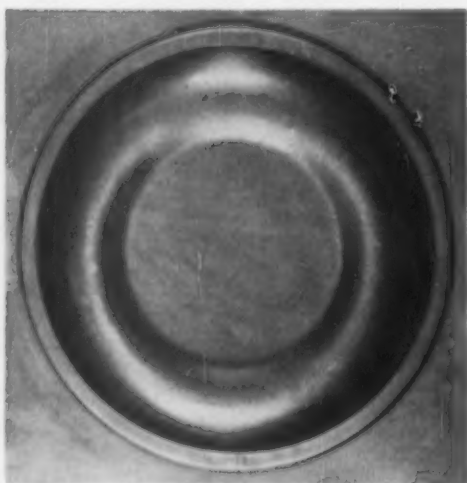
It is also common to use nuts and washers made of the same material as the tie rods. The washers are often made from squares drilled through their centers. Cast washers are also available. Sometimes a flat bar with properly spaced holes may run the entire height of the tank, serving as a reinforcement and replacing conventional washers.

Scuff plates to protect tank rims and bumpers to protect tank ends and sides are parts requiring tough material, resistant to both wear and corrosion.

On conventional press—

## Transfer Die Forms Impellers From Strip Stock

By HERBERT CHASE, Consultant, Forest Hills, N. Y.



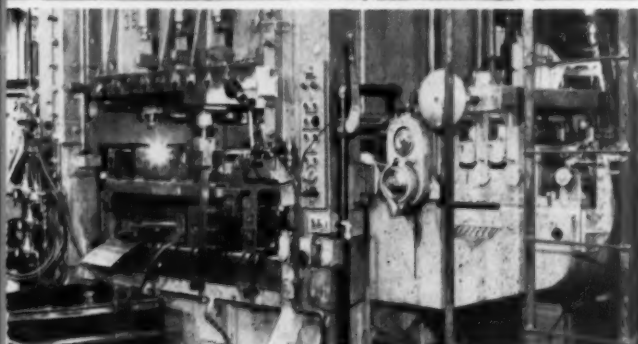
THREE STAGES of impeller forming done at the three transfer die stations are shown above and below. Impeller is made from deep-drawn coil strip, 0.030 in. thick and 13½ in. wide.

♦ One way to stamp this torque converter part would require three dies, three presses and three operators . . . Buick chose to use a three-station transfer die on a conventional press for efficient, automatic production . . . The transfer device is built into the die as a separate unit and is actuated by the press ram.

♦ The press is set for 15 strokes per minute, produces a finished part at each stroke . . . One man attends the entire automatic operation to see that the setup functions properly . . . Transfer die draws, punches, forms and trims complex pieces from coiled strip stock.







Top: THREE-station transfer die receives strip material at right, finishes impeller at left.

Bottom: ROLL feeder at right also levels strip stock before it moves into automatic transfer die.

◆ A THREE-STATION transfer die on a conventional press works on coiled strip stock to draw, punch, form and trim torque converter impellers at the rapid rate of 15 finished parts per minute.

As shown in the photograph, this impeller for the new Buick Dynaflo transmission is a circular, dome-shaped stamping whose blades are formed from 12 irregularly-shaped slots in the dome section. The raw material is deep-drawing coiled strip stock, 0.030 in. thick and 13½ in. wide.

In production, the impeller blades are made by slitting the metal along the curved edge of each slot. This flap is formed back under the dome at right angles. Since the bend is made along an arc, the blades are not only folded back by the slitting punches but also undergo some metal flow as this is done.

The special 3-station transfer die is used in an H2 Danley press of 300 ton capacity. Strip stock is fed from a coil and simultaneously leveled by a Littell roll feed bolted to the side of the press. Stock comes to the roll feeder from a power driven uncoiler. The uncoiler starts when the strip is pulled tight enough to actuate a limit switch.

Although the press itself has no transfer mechanism, a transfer device of Danley make is built into the Sheffield die as a separate unit and is actuated by the press ram. The combination has the same general effect as a non-transfer die used in a transfer press.

At the first station, the die draws the dome section and its surrounding flange. In the same stroke, the partially formed piece is cut off the stock strip. This partly formed blank is left on the punch or lower half of the die. The upper half of the die raises when the press opens.

The transfer mechanism picks up the partly-formed blank as soon as it is freed and shifts it to the second station. There, the piece drops onto the punch which, because of its dome-shaped contour, automatically positions the work for the second operation. During this transfer, the intermittent feed advances a section of unformed stock for its initial draw in the next working stroke.

#### Die carries 12 punches

At station No. 2 the die carries 12 punches. Each punch first makes a slit in the dome section and then forms a blade by pressing the resulting metal flap against a vertical face on the lower die.

While this slitting and forming is being done, another punch pierces a small circular hole at the center of the dome. At the same time, two more punches sever the metal outside of the flange so that, when waste trimming is done at the third station, the scrap will fall away in two pieces. As the die opens the drawn and punched workpiece is transferred to the third work station.

At station No. 3 the die trims the circular flange and pierces out the large center section. For these operations, the stamping is positioned automatically, as at the No. 2 station. The outer scrap halves fall from each side of the die onto a belt that drops them into a scrap box. The large section that is sheared out of the stamping's central circle is pushed through the die and falls onto another belt that drops it into the scrap box.

#### Ejects part automatically

The impeller is completely finished at the third station, and is removed from the die automatically. The transfer mechanism picks up the finished stamping, transfers it over the end of the die and drops it into a chute leading to a tote box. This operation completes the cycle.

Since the press runs at 15 working strokes per minute, and finishes a complete part at each stroke, production is rapid. One man attends the press constantly, even though its action is completely automatic. It is the attendant's duty to see that the entire setup functions properly and to shut the press down instantly if necessary.

It would be possible to perform equivalent impeller-forming operations in three separate dies, each in its own press and with its own operator. But this would be much less efficient and would probably require some manual handling which is unnecessary with the single large press and its transfer die.

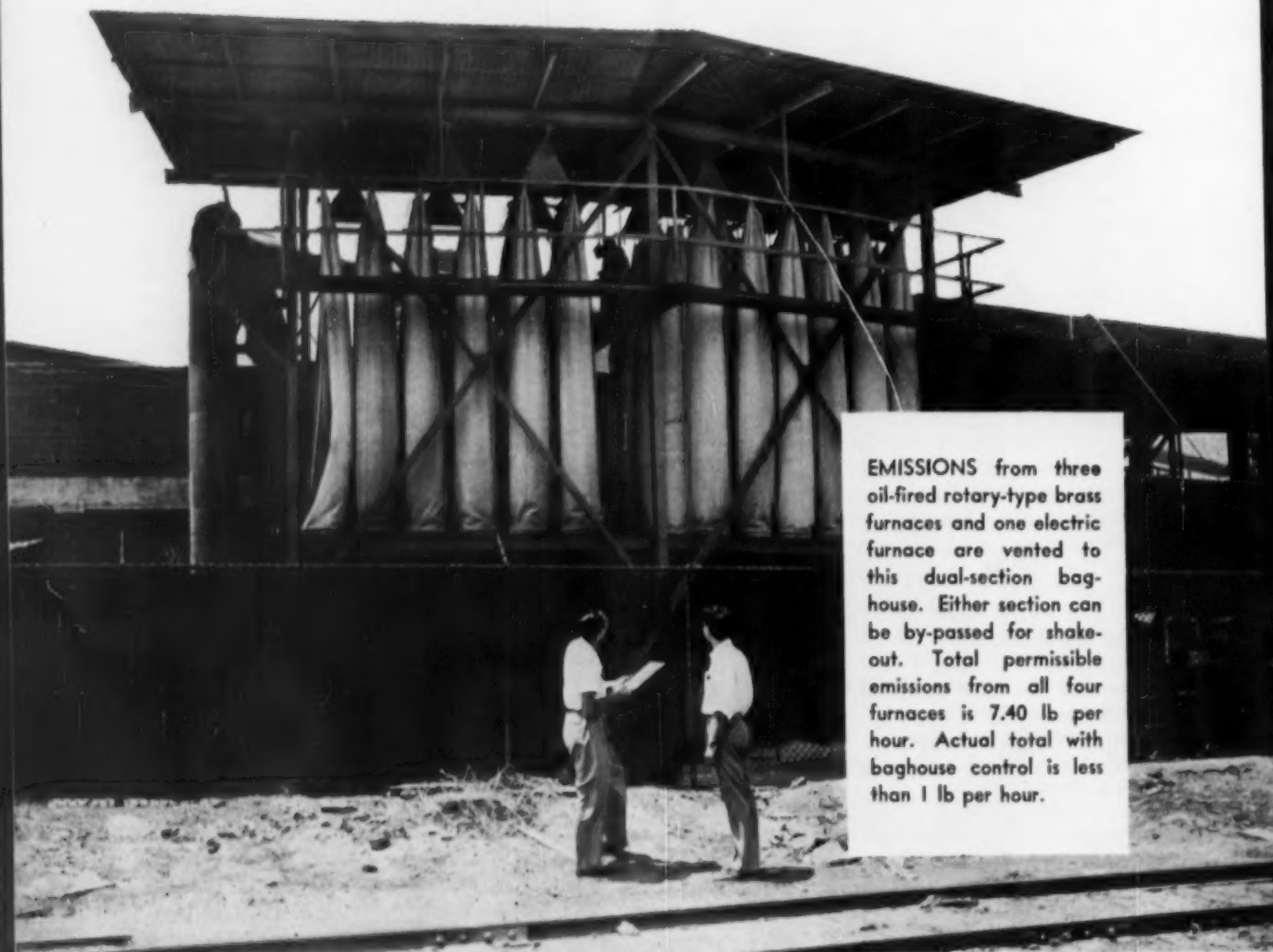
# Air Pollution: Furnace Types and Sizes Dictate Most Effective Controls

Part III

♦ Effective air pollution control for plants melting nonferrous metals depends on the metals processed and the furnaces used . . . In brass melting, yellow grades usually require more elaborate measures than the red alloys.

♦ In aluminum plants, oily scrap chips may call for special chip driers and after-burner equipment . . . Lead smelters find baghouses to be the most practical and profitable way to comply with community "smog" regulations.

By N. R. SHAFFER, Engineer,  
and M. A. BROWER, Technical Assistant  
Air Pollution Control District  
Los Angeles County, California



EMISSIONS from three oil-fired rotary-type brass furnaces and one electric furnace are vented to this dual-section baghouse. Either section can be by-passed for shake-out. Total permissible emissions from all four furnaces is 7.40 lb per hour. Actual total with baghouse control is less than 1 lb per hour.

**RADIATION** and convection cooling towers at this nonferrous smelter condition furnace emissions before venting them to a baghouse. Cooling keeps gases from burning filter bags.

**FURNACE** venting is important in fume control. This hood lowers directly over rotary-type brass furnace for maximum pickup, directs fume to baghouse for particle entrapment.

♦ **WHETHER** a nonferrous foundry in Los Angeles County needs a gas conditioning unit and a cloth filter baghouse depends on the amount of dust and fumes that foundry releases to the atmosphere. Nonferrous emissions vary greatly not only with the types of alloys melted, but also with the melting method, furnace design, type of flux used, pouring method, and the cleanliness of the material melted.

Every nonferrous foundry in Los Angeles County today is in compliance with both the opacity-of-emission regulation and the stringent dust and fume regulation of the County Air Pollution Control District. The latter ordinance establishes allowable emissions in pounds per hour depending on process weight.

Since nonferrous processes are so variable, no rule can be laid down as to which type of melting will require air pollution control equipment and which will not. But where really effective control is necessary, baghouses have proven to be most successful.

In brass melting, the yellow grades have generally been found to require more elaborate pollution controls than the red brasses. This is

This article, discussing air pollution controls for nonferrous foundries and smelters, is the third and last of a series. Part I, describing steel mill controls, appeared in the April 28 issue. Part II, in the May 5 issue, covered pollution controls for gray iron foundries.



due to the greater amount of zinc in yellow brass, which is driven off as zinc oxide.

District tests on yellow brass melted in crucible or tilt-type furnaces have shown losses without control equipment ranging from 0.181 to 8.67 lb per hour for every 1000 lb of metal melted.

One Vernon, Calif., firm melting yellow brass containing 12 pct zinc, uses two tube-type baghouses with Orion bags. A 5-ton rotary furnace and a 40-ton reverberatory furnace, both oil-fired, vent their emissions to the baghouses after the gases are cooled by air and water. Either or both baghouses are used depending on the load. The baghouses give a maximum filter area of 7778 sq ft and have a 3:1 air to filter ratio.

#### **Emissions well within limits**

The maximum discharge allowed this firm under the District's regulations is 2.8 lb per hour from both furnaces. But the controlled emissions are well below this figure. The baghouse collects 2.81 lb per hour from the rotary furnace and 51.8 lb per hour from the reverberatory furnace.

Another brass foundry in Vernon, melting an alloy with 23 pct zinc, found emissions from its 5 crucible tilt-type furnaces in violation of the rules. Regulations allowed each furnace a maximum discharge of 2.63 lb per hour. Installation of a tubular-type baghouse with 240 silicon-

treated glass wool bags reduced total discharge from the 5 furnaces from 13.1 lb to less than 1 lb per hour.

Red brass emissions, classified here as those coming from copper alloys with less than 9 pct zinc, can usually be held within dust and fume regulation limits with a simple slag or flux cover. Tests on crucible furnaces have shown that losses with slag covers range from 1.24 to 2.41 lb per 1000 lb of red brass melted.

Rotary and tilt-type red brass furnaces tend to create a greater particulate emission than the crucible type. This is due to agitation of the metal during the periodic rotating or tilting and also to the method of firing. But, flux or slag covers on these furnaces can control up to 7.52 lb of emissions per 1000 lb of metal melted. Without slag covers, rotary and tilt type furnaces have emitted up to 18.3 lb of dust and fume per 1000 lb of melt.

Emissions are low when electric furnaces are used for either red or yellow brass. One induction furnace, melting yellow brass, discharges only 0.19 to 0.48 lb of particulates per 1000 lb of charge. Losses from electric resistance and electric arc furnaces, however, are higher than those from an induction type. This is due mainly to metal agitation which allows greater exposure of zinc to oxygen.

One indirect arc electric rocking furnace, for example, passed the strict rule on particulate emissions without passing the opacity regulation. This 500 lb capacity furnace melting Navy M brass, was allowed a loss of 1.78 lb per hour. During tests, using a flux cover, only 0.895 lb per hour was emitted. But since the opacity of the emissions was 40 pct or greater for more than three minutes, a permit was denied until a baghouse was installed.

#### **Oily chips present problem**

Aluminum melted in Los Angeles County varies from ingots to scrap containing magnesium shavings. In small job shops, a crucible or tilt-type furnace is usually used, and little degassing or "demagging" is done. Consequently, emissions are extremely low and no controls are required.

In secondary smelting, however, scrap is usually melted in a reverberatory-type furnace where emissions vary from 1.47 to 7.26 lb per 1000 lb of metal melted. These furnaces require controls, and so do aluminum sweat furnaces.

An additional air pollution problem occurs in aluminum scrap melting when oily chips are present. The oil escapes as smoke, often causing an opacity violation. Los Angeles County foundries melting this type of material have installed chip driers which burn this oil off the chips before they are melted. Smoke created in the chip drier is burned in an afterburner.

One large secondary aluminum smelting firm in the East Los Angeles area uses a rotary chip

drier and an aluminum sweat furnace. This setup is vented through an afterburner to radiation cooling towers and then to a 4-unit baghouse. The afterburner has two gas burners which effectively reduce the oil smoke from the chip drier. The baghouse, with an air to filter ratio of 1.94:1, also controls the fumes from the sweat furnace.

With a process weight of 500 to 2800 lb per hour, district regulations allow this operation an emission of 1.77 to 4.92 lb per hour. Actual emission from the baghouse is under 1 lb per hour.

#### **Control all lead melting**

This same firm operates a 20-ton aluminum reverberatory furnace and uses a flux consisting of aluminum chloride, potassium chloride, sodium chloride and potash. Emissions from this furnace pass through a series of radiation cooling columns to a baghouse with a total cloth area of 2000 sq ft. While the air to filter ratio is 2.5:1, particulate emissions to the atmosphere are reduced by 86.3 pct and chlorides by 77.8 pct.

Although many lead smelters in the district had long used baghouses for product recovery, excessive emissions from all lead melting operations are now controlled in the same manner. Actually, lead is one of the few materials whose recovery is profitable.

One of the most elaborate baghouse systems is used in a large smelting plant in the Vernon area. At this installation, emissions from two 60-ton refining pots, two blast furnaces, one 60-ton reverberatory furnace and one rotary sweat furnace all went to a common control system. Five blowers take emissions first to a cooling chamber, then to two cyclonic separators, two settling chambers, two spray chambers, a 10-section baghouse and a 3-section baghouse.

Another lead smelter operates a 40-ton reverberatory furnace, a 1 ton per hour battery sweating tube, a 30-in. blast furnace and 3 melting pots. Since only one of the first three pieces of equipment is used at a time, all of the equipment is vented to one baghouse. A series of cooling towers is arranged so that they can be by-passed if the temperature of a particular emission is low.

The smelter's 6-section baghouse uses wool dynel bags to provide 1632 sq ft of filter area. Regulations allow the sweating tube alone a loss of 4.14 lb per hour, but its loss after the baghouse treatment is only 0.5 lb per hour. Allowed loss for the reverberatory furnace itself is 2.8 lb per hour, but the baghouse reduces this also, to only 0.4 lb per hour.

Both the district and the metal industry can be proud of their progress in air pollution control. Today, every ferrous and nonferrous foundry, mill and smelter in Los Angeles County fully meets existing regulations for control of dusts and fumes.



*Cheaper plates for offset—*

## Method Cuts Costs of Reproducing Vital Industry Papers

- ♦ An improved method of making paper plates for offset reproduction is saving Chrysler Corp. more than \$250,000 per year . . . Used in reproduction of engineering drawings, letters, and reports, the method saves time and money.
- ♦ The need for blue printing has been virtually eliminated . . . Paper requirements have been cut . . . Less floor space is used . . . The process can be applied to reproduction of press releases, correspondence, financial statements.

### INDUSTRY COMMUNICATIONS

Communications are today absorbing more and more of the attention of thoughtful management planners. Industry now employs one office worker to two factory workers. Business adds to its volume of records at the prodigious rate of one and a quarter trillion pieces of paper each year. The generation and maintenance of industry records offers tremendous opportunities for cost savings.

Industry needs not less but more information. Stripped of its lines of communications and fact gathering and retaining facilities business would stutter to a halt. Today industry is in the process of reevaluating the techniques by which it talks to itself.

In this series of three articles *The IRON AGE* brings you practical solutions to some communications problems. This first article suggests a less costly method of reproducing paperwork.

Part II in the May 19 issue tells how one plant successfully tackled the enormous problem of codifying its vast library of technical reports to make more information available to engineers in less time and at lower cost.

Part III in the May 26 issue describes the application of facsimile reproduction using leased telephone lines. It both eliminates paperwork and supplies information between plants faster.

♦ **STATIC ELECTRICITY**, once an implacable enemy of printers, has been harnessed and put to work. This accomplishment has made it possible to save time and money where engineering drawings, bulletins, special reports and documents have to be reproduced quickly, accurately and at low cost. The process is practical in runs as low as a dozen copies or less.

Ability of light sensitive plates to hold an electrical charge is the magic behind Chrysler Corp.'s new method of reproducing engineering drawings and similar documents.

The Xerox service staff maintained by Chrysler Corp. at its John R plant is not large. The staff includes six operators of its Xerox equipment, offset duplicator and addressograph machines, plus mailing and office clerks. Here is what has been accomplished by this small group, using this modern method of reproduction and efficient work planning.

#### **Get 100 copies in 15 minutes**

1. Since March, 1953, more than 250,000 offset Xerox plates have been made, including all of Chrysler's central engineering drawings, ranging in size up to 24 x 36 in.
2. Where speed is essential, it is now possible to provide 100 copies of a drawing, bulletin or an important document in 15 minutes.
3. Plate cost has already been reduced to 15¢, and may be reduced still further.
4. Duplicating equipment including non-reducing cameras are leased at a cost of approximately \$100 per month per operator. Reducing cameras are also leased.
5. Up to 55,000 copies have been made from a single plate.
6. Previously untrained operators are taught to run the equipment in a few days. Last year, an average operator was able to reproduce, on an average, 12 drawings per hr.
7. While Xerox is naturally most economical for longer runs, it is also competitive for many jobs where only a few copies are required.
8. Adoption of this reproduction method is saving Chrysler Corp. Engineering Dept. great quantities of sensitized paper each year, as well as thousands of cubic feet of file storage space. Many hundreds of hours of unnecessary paper handling time have been eliminated.

"Up to now, we've only scratched the surface," Chrysler officials say.

The continuing struggle to find a better,

faster and cheaper method of reproducing engineering drawings has found an answer with the development of a new Xerox plate coated with a positive, light sensitive compound.

Invented by Chester Carlson, a New York patent attorney, the process was developed by Battelle Memorial Institute. In 1944, Haloid Corp., Rochester, N. Y., took out licenses on the process and is now leasing (or selling) the equipment.

Here's how the process works. The Xerox plate is mounted in the back of a camera and given a positive electric charge to make its photo-conductive selenium-coated surface light sensitive. The plate is then exposed to the lighted drawing or copy. Effect of the exposure is to bleed off the electric charge on the plate except for those areas which were light, shielded by the dark, non-reflecting lines of the drawing or image. Thus, the image remains as a positive electric charge on the plate.

#### **Heat makes image permanent**

Development of the plate follows. The plate is placed in a tray containing a dark, resinous development powder. As the tray is rocked, the powder is cascaded over the plate. The negatively charged powder adheres to the positively charged areas of the plate. Thus, the powder adhering to the plate forms a slightly raised image of the original copy. All development on the plate is carried out under ordinary light using a plate holder to mask the sensitized plate.

A paper master is then placed over the plate. The master receives a positive electric charge which causes the electro-statically held image formed by the powder on the plate to transfer to the paper.

After transfer of the image, the operator strips the paper master from the plate. At this point the image is held in place only by the static charge and may be cleaned or removed from the plate.

To make the master permanent, it is placed in the fuser unit. Heating elements dissolve the resinous elements in the powder image on the surface, causing them to impregnate the fiber of the paper.

To produce duplicate copies, the paper is mounted on the cylinder of the offset duplicating machine.

If necessary, a duplicate master can be made quickly from any good copy. If corrections are necessary, the drawing is first copied on the Xerox plate. Before the plate content is transferred to the paper master or before fusing, the part to be changed is wiped off. The master is then completed and the changes are drawn or typed on the master.

As indicated in the accompanying photograph, each operator controls 3 or 4 pieces of equipment. In order of use these are: (1) processor, (2) camera, (3) fuser, (4) tone tray.

Cost of preparing a plate, using the standard offset method and Xerox, greatly favors the



Top—left: **CAMERAS** shoot original pictures and copy as first step in making negative by Xerox process.

Top—right: **DEVELOPMENT** of sensitized plate yields negative from which a positive paper plate is made.

Bottom—left: **MASTER** paper plate is positioned on hooks of offset machine then wrapped around machine drum.

Bottom—right: **STAFF** has handled more than 250,000 reproduction jobs—including printing—in slightly over two years. One hundred copies of a drawing can be reproduced in 15 minutes.

*May 12, 1955*



## **With a special camera large drawings can be reduced to a 36 x 48 in. negative . . .**

latter method. Chrysler estimates that standard offset plates 8½ x 11 in. cost the company from \$2.50 to \$3.90 per plate. A comparable cost figure for a typical Xerox plate is \$0.15.

Chrysler's practice is to purchase selenium-coated plates in quantities that bring the cost to about \$18 each. Up to 1000 reproductions can be made during the life of a plate. The plates are not re-coated although this could be done, if desired.

The practice of assigning individual plates to an operator has worked well with Chrysler and has resulted in maximum turnout of quality work at minimum cost. This policy undoubtedly encourages pride of workmanship.

Experience has shown that if plates are used continuously they tend to "fatigue." It is, therefore, advantageous to rotate the plates, permitting each plate to rest after use. Chrysler provides each operator with 4 to 6 plates which are rotated. This practice has resulted in reproductions of uniformly high quality; it also tends to equalize and extend the life of the plate.

Table I shows standard Chrysler practice when duplicating engineering drawings, including the amount of reduction. It will be noted, for example, that in duplicating a drawing 24 x 36 in., a 50 pct reduction in paper requirements is accomplished.

## **How Chrysler Uses XEROX**

---

**Engineering drawings**  
**Textbooks**  
**Technical reports**  
**Office and factory forms**  
**Correspondence on defense contracts**  
**Copying technical magazine articles**  
**Tooling manuals**  
**Drafting manuals**  
**Engineering manuals**  
**Engineering orders and changes**  
**Standard manuals**  
**Training course books**  
**Technical reports**  
**Financial and operating statements**  
**Dealer bulletins**  
**Press releases**

Chrysler's need for a fast, low-cost reproduction method for engineering drawings is indicated by the fact that, on an average, 65 copies are required of an authorized production part.

In addition to standard cameras for reproducing drawings up to 12 x 18 in. Haloid and Chrysler engineers have devised a camera for reducing larger drawings to a maximum negative size of 36 in. x 48 in. In this setup, an entire light tight room is part of the camera. The lens is mounted in the wall of the room. While an operator on the outside mounts a large drawing under glass, the operator inside the camera room focuses the camera, makes other necessary adjustments and takes the picture. Complete facilities for developing the Xerox plate are installed "inside the camera." This equipment is very flexible and can be used for any drawing that is too large or too bulky to handle in a standard duplicating or reducing camera.

### **Reports reproduced without retyping**

When used in conjunction with modern offset equipment, Xerox plates make possible very high rates of reproduction. Fully automatic offset machines will feed 6000 sheets of paper per hour. Allowing for plate changes, it is not unusual to turn out up to 4500 pages per hour from a single machine.

Half tone screens are not always necessary but may be used if desired to give excellent reproduction quality in a report or document.

In addition to its duplication work on engineering drawings, Chrysler is already reproducing office forms for many of its departments. An office form already in use can be duplicated in a few hours.

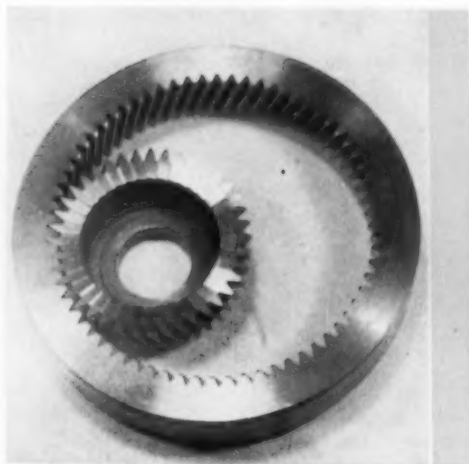
At the present time, more than 200 departmental reports are being reproduced. In some instances, the reports are reproduced without retyping, thereby saving considerable time and entirely eliminating typing or typesetting expense. This method has proved to be particularly effective in the reproduction of statements that previously required retyping prior to consolidation. A savings of \$1,200 per year has been realized by reproducing a single report of this kind.

Another advantage of this reproduction method is the ability to duplicate confidential reports quickly without sending the master copy outside the Chrysler organization. In a number of instances, time required to obtain offset plates from outside sources has been reduced from 50 to 90 pct.

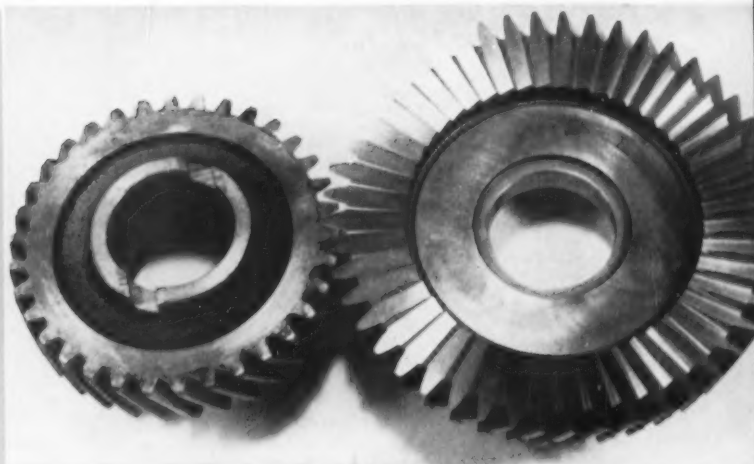
It has also been demonstrated that duplicating equipment of this kind is especially effective in reproducing reports from overseas operations and branches. Reports in foreign languages previously required many hours of typing and proof reading and offered many excellent opportunities for introducing errors into the duplicate copies.



## Develop Better Sharpening Methods for Gear Shaper Cutters



CUTTER life was doubled by 8° change in helical rake angle, 5° increase in face angle.



VARIOUS rake angles on 48-tooth cutter at right produced wear results shown in Chart A.

By J. F. JONES, JR.  
Factory Engineer  
The Fellows Gear Shaper Co.  
Springfield, Vt.

♦ Chip crowding is often the culprit when gear shaper cutters wear too fast, causing gear errors and poor finish . . . Changes in cutter sharpening practices can frequently improve tool life and gear quality.

♦ With helical cutters, changing the helical rake and face angles brings better "chip flow control" . . . Life of spur gear cutters can often be multiplied by sharpening them to either break up chips or direct their flow.

♦ BETTER TOOL LIFE, increased production and improved gear quality can often be achieved by sharpening gear shaper cutters so that they will encourage chip flow and prevent chip crowding.

Main cause of gear cutter wear is chip confinement in tooth spaces during the cutting operation. This chip crowding, because of its harmful effect on cutter wear, may also cause gears to err in their lead, "Red Line," involute and finish characteristics.

Sharpening techniques designed to promote controlled chip flow are logical approaches to maximum cutter life, and to more continuous, high quality production.

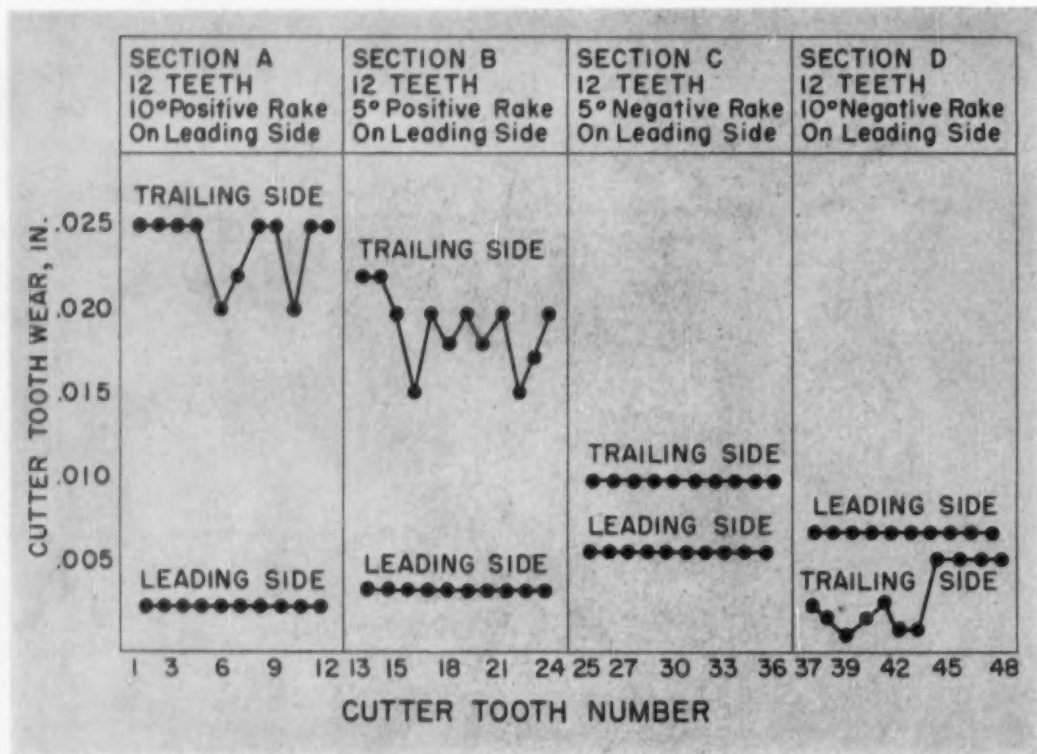
Continuing investigations on helical and spur gear cutters by The Fellows Gear Shaper Co., Springfield, Vt., show that sharpening for "chip flow control" will (1) redirect chips to reduce the damaging effects of crowding, (2) weaken chips so that they will break or bend before causing harm, (3) redistribute the cutting load

over more of the cutter tooth, and (4) balance cutting forces to reduce gear errors.

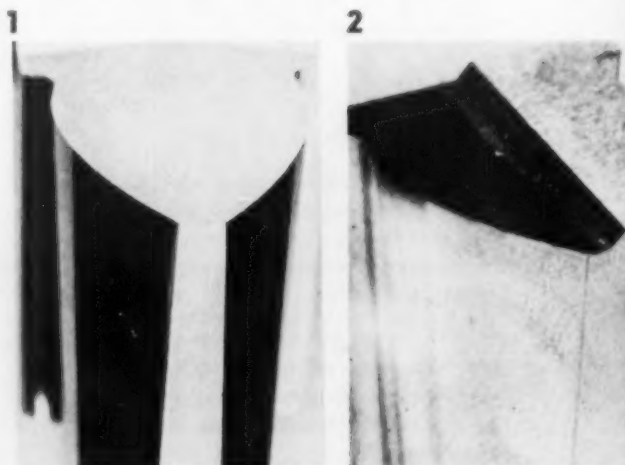
With helical cutters the company found that a very simple change in rake angle can produce a startling improvement in tool life as well as an improvement in gear quality. For example, changing the helical rake angle of one cutter 8° toward spur, plus a 50° increase in the face angle, meant twice as many gears cut with only half as much wear as formerly. In addition, it meant only one shaping cut was required.

The chart below illustrates the relation between tool wear and sharpening angles on a 48-tooth cutter used for one test series.

Helical cutter sharpening for "chip flow control" is done either on a fixture or a special machine, and in either case involves the setting or simple changing of two angle adjustments. One is for the helical rake angle, which is measured in a plane tangent to the pitch surface. Normal sharpening calls for this angle to be equal to the helix angle of the cutter.



- 1 SPUR cutter tooth sharpened by "roof top" method on face showed  $2\frac{1}{2}$  times normal life.
- 2 "TWO-STEP" sharpening puts leading and trailing edges of spur cutter in different planes.
- 3 SMALL "V" notch at tip of spur gear cutter tooth weakens chips and controls their flow.
- 4 A SLIGHT land ground at tip of tooth face reduces the tendency for cutter to chip.



The other adjustment is for the face angle, which is measured in a plane passing through the center line of the cutter tooth and is usually set at 5°.

Sharpening a helical cutter for chip flow control usually involves reducing the helical rake angle between 8° and 12°. Generally the 8° change is used, which means the cutter is sharpened more nearly like a spur cutter. Sharpening for controlled chip flow also means increasing the face angle to 10° from the usual 5°. The increased face angle is only undesirable when hard materials are being cut and there is a tendency for the cutter to chip.

Sometimes a new sharpening angle will require a change in cutter tooth shape. This can be done by regrinding the cutter. Tooth shape changes will most likely be needed for cutting coarse pitch gears which are not to be shaved. When pitches are finer than 10 diametral pitch, or when shaving is involved, the rake angle changes for better chip flow will probably not require cutter tooth shape changes.

#### How to balance wear

Normally the wear on a helical cutter of 3 to 20 diametral pitch, cutting steel gears, occurs on the trailing side. Although this side does very little cutting, the wear condition calls for a large amount of grinding during sharpening.

Reducing the helical rake angle toward spur tends to balance wear on both sides of cutter teeth. It reduces wear on the trailing side, and increases it on the leading edge for improved tool life. Usually at about an 8° change the wear on both sides becomes equal, provided that the direction of rotation is conventional.

This change in helical rake angle also reduces gear lead and "Red Line" errors, and sometimes involute errors as well. Gear quality improvements will frequently be greater if the angle change toward spur is 12° instead of 8°. For this reason the full 12° is sometimes used.

The direction of rotation of cutter and work also has a bearing on gear quality and cutter life. When "chip flow control" is to be accomplished this direction of rotation becomes increasingly important.

Conventional cutter rotation on a gear shaper producing helical gears is such that each cutting stroke will push the work backward.

#### Makes leading edge obtuse

A right hand cutter, cutting a left hand helical external gear or a right hand helical internal gear, will rotate counter clockwise when viewed from above. And the 8° to 12° helical rake angle change, in combination with the conventional direction of rotation will make the leading edge of each cutter tooth the obtuse angle.

In the case of spur gear cutters the practice of changing helical rake angle is not desirable because it would impose damaging rotational loads on the cutter and work. But other sharpening methods are available which will either: (1) Control direction of chip flow to reduce damaging effects, or (2) weaken the chip.

One helpful method that can be applied to spur cutters is a so-called "roof top" or double negative sharpening. Here each tooth has a peak on its center line with the sides sloping away from the center line at a 7 to 10° angle. This treatment can be combined with a positive face angle of from 3 to 10°.

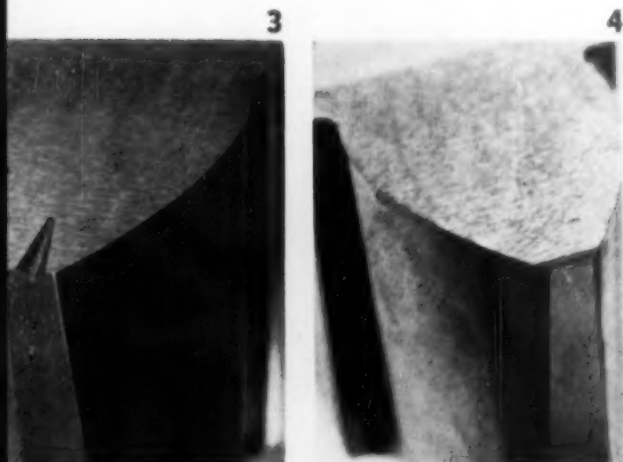
"Roof top" sharpening can be done with a formed wheel on a helical cutter sharpening machine. In test, cutters sharpened this way demonstrated two and one-half times as much tool life as cutters with the conventional 5° face.

Another spur gear cutter technique is two-step sharpening to form the leading edge in one plane and the trailing edge in another. In test, this method increased tool life four times above that obtainable with conventional cutters.

A third sharpening method is to create a small "V" notch at the tip of each tooth. This notch, approximately half as wide as the tip land, serves to weaken chips and also control chip flow. In test, this produced three times more tool life than the standard 5° face.

Generally, a high face angle on spur gear cutters will help chip flow conditions even when it is combined with any of the aforementioned three sharpening methods. But a high face angle does create a tendency for teeth to chip at the outside diameter. This tendency may be reduced by grinding a slight land at the face tip.

Tooth shape of spur gear cutters is also a factor in "chip flow control." A tooth which is narrow at the tip will wear much more rapidly than one which is wide at this point. For example, roughing cutters made to cut extra depth may be inefficient because of narrow land. Actually, tests show that tool life is proportional to width of land on tooth tips. By doubling land width, for instance, tool life will be doubled.



## Automatic Setup Tinplates Aluminum Pistons

♦ A FAST, NEW automatic plating setup applies tin coatings to 510 aluminum alloy pistons per hour at the Melrose Park, Ill., plant of International Harvester Co. The plating process is non-electrolytic. Instead, it deposits 0.0003 to 0.0005-in. thick tin coatings to replace equal thicknesses of aluminum which the process removes from all exposed piston surfaces.

The pistons are plated after all machining operations are complete. Tin coating is intended to prevent excessive piston wear during the initial run-in period for the gasoline and diesel tractor engines made at the same plant.

### Install high-speed machine

To do this plating with high-speed efficiency, the company recently installed a new Udyllite machine of the same general type used for electrolytic plating. Racks holding six pistons each are first loaded by hand, after which the machine automatically transfers them from tank to tank and precisely controls their immersion times in each solution. At the end of the cycle, the tin-coated pistons are unracked by hand and placed on pallets for transfer to engine assembly lines.

Since the machine handles 85 racks an hour, 510 pistons can be plated in this time. The coating does not change piston dimensions because it merely replaces an equal thickness of aluminum.

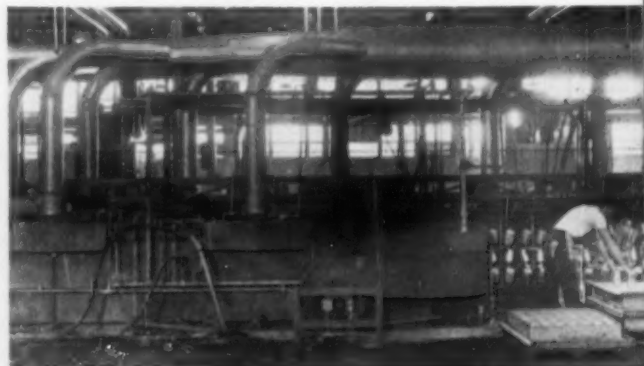
Before they are racked for plating, pistons are put through a separate washing machine to remove chips and oil left from prior machining operations. After hand racking, the first machine process is a soak cleaning for 63 seconds in a tank that is three rack spaces long. The racked pistons are then given a series of cold tap water spray rinses in single rack-space tanks. Each rinse takes 21 seconds.

Rinsing is followed by a 21-second etch in 20 pct nitric acid and then by two 21-second dip and spray rinses in cold water. These three operations are also done in single-rack tanks.

After these preparations, racks and pistons enter a tank containing a potassium-tin stannate plating solution which is held at 160°F. It is also air-agitated and continuously filtered. Time in the 15 rack-space plating tank is 315 seconds.

The plated pistons next receive two 21-second cold dip and spray rinses in single-rack tanks and a final 63-second hot rinse in a triple rack-space tank. Hot rinsing is followed by hot air drying in a tunnel for 185 sec. Air in the tunnel is circulated by a blower.

The drying operation leaves pistons ready to be unracked by hand as they pass the pallet shown at the right in the illustration. There are 11 rack spaces for unloading and reloading. The racks remain on the conveyor of the machine as they pass these spaces.



TINPLATING setup is fully automatic except for hand loading and unloading of pistons.





From the collection of Paul J. Westergard, New Jersey Arms Collectors Club. Maker: Samuel Evans, Cambridge, England, 1800-1820. Prints of this illustration suitable for 11 by 14 frame available on request on company letterhead.

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REPRESENTATION IN PRINCIPAL CITIES

## FREE AIDS

# New Technical Literature:

## Catalogs and Bulletins

### Blind rivets

The story of an ingenious fastener which is indispensable in aircraft manufacture and has been adapted for commercial use generally is told in a booklet. The commercial blind rivet can be used for quick, secure and economical fastening in appliances, awnings, automobiles, cabinets, conveyors, duct work, furnaces, machinery, trailers, radio sets, etc. *Townsend Co.*

For free copy circle No. 1 on postcard, p. 117.

### Fire hood

The MSA hood which protects the head, face, neck and shoulders against extreme heat is described in a bulletin. Features include a cape made of aluminized glass cloth with a neoprene vapor barrier and wool insulation, draping free below the neck and spreading out to cover the shoulders. *Mine Safety Appliances Co.*

For free copy circle No. 2 on postcard, p. 117.

### Grout requirements

A handy pocket-size card for estimating grout requirements of heavy equipment, machinery, anchor bolts, building columns, and bridge seats has just been released. Card is designed for use by contractors, engineers, and plant maintenance personnel as a convenient reference. *Master Builders Co.*

For free copy circle No. 3 on postcard, p. 117.

### Dc contactors

Heavy duty dc contactors, including the new Type 522 units and control relays for steel mill and similar heavy industry applications, are described in a bulletin. A feature of the line is the high degree of parts interchangeability which permits considerable reduction in spare parts inventories. *Allis-Chalmers Manufacturing Co.*

For free copy circle No. 4 on postcard, p. 117.

## FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 117.

### Tolerance standards

A 4-page illustrated reference manual lists standard tolerances for multiple thread milling cutters. Tables list tolerance standards of all commercial sizes of shell and shank-type multiple thread milling cutters. Tolerances are given for precision ground, commercial ground, accurate unground and commercial unground classes of cutters. *Star Cutter Co.*

For free copy circle No. 5 on postcard, p. 117.

### Oil filters

A complete line of multi-cartridge oil filters is described and illustrated. Advanced engineering features include: easy-to-change cartridges, choice of six filter media, and electric, steam or hot water heat. These filters have a wide range of uses, and are recommended for engine lube and fuel oils, hydraulic oils, cutting oils, grinding oils, coolants, quench oils, and air filter oils, plus others. *Filtration Div., Houdaille-Hershey of Indiana, Inc.*

For free copy circle No. 6 on postcard, p. 117.

### Uniclosed motor

A 12-page booklet illustrates the features of the new U. S. Type H Uniclosed motor. Cut-open views of motor, illustrating its various constructional features, are shown in full color. The new type H is more compact than previous models. *U. S. Electrical Motors, Inc.*

For free copy circle No. 7 on postcard, p. 117.

## FREE TECHNICAL LITERATURE

### Laminated plastic

Dilecto offers a catalog on a group of over 50 different fillers and resins combined by lamination and polymerization into a dense plastic. Each combination (or grade) has different properties, but all are mechanically strong, non-metallic, light in weight, and chemically inert to a remarkable degree. Topics covered include: glass base Dilecto, polyester glass, asbestos base laminates for applications requiring resistance to heat, post-forming — the easy, inexpensive way to make complex parts, rolled and molded tubes, molded and turned rods for high speed production on automatic screw machines. Charts are included. *Continental-Diamond Fibre Co.*

For free copy circle No. 8 on postcard, p. 117.

### Homocarb method

"The Homocarb Method with Microcarb Atmosphere Control for Heat Treatment of Steel," a 20-page catalog, tells how Homocarb furnaces with Microcarb control are being used for case carburizing, carbon restoration, homogeneous carburizing and hardening of steel products on a reproducible, mass-production basis. Installation photos and case histories tell why this method is helping produce better products at less cost in hundreds of plants. *Leeds & Northrup Co.*

For free copy circle No. 9 on postcard, p. 117.

### Welding stainless steel

The 1955 edition of the handbook on the welding of stainless steels is now ready. Its 48 fact-filled pages should prove to be of value to everyone interested in the arc welding of stainless steels. The handbook describes the various types and properties of stainless steels, the practical procedures for their welding, and the types of electrodes available for such use. For the welder, welding engineer and the design engineer it is a helpful guide. It also gives data on chemical analysis, mechanical properties, uses of stainless steels and the heating resisting metals. *Electrode Div., The McKay Co.*

For free copy circle No. 10 on postcard, p. 117.



## Unitizing eliminates two handlings —cuts cost!

Automotive springs formerly were shipped to the factory loosely piled in a freight car. Two handlings and many hours later they arrived at the assembly line.

Today, almost universally, automotive springs are loaded on 35½" x 39½" expendable\* tray-top pallets which are *unitized* into strong, lossproof units that move directly from the freight car to the assembler—*eliminating two handlings!*

This change in handling methods reduced handling and labor costs, saved on demurrage charges, reduced stenciling and marking costs, eliminated loss of products, reduced pallet storage costs, and released tote boxes and trucks for other in-plant uses.

### Methods adaptable to many products

Signode methods of unitizing now are used to simplify handling of small containers, subassemblies, component parts, and a wide variety of finished products. These methods effect many savings for both shipper and receiver. For a complete survey of your packaging and shipping methods—with an eye toward greater economy—write

# SIGNODE Steel Strapping Co.

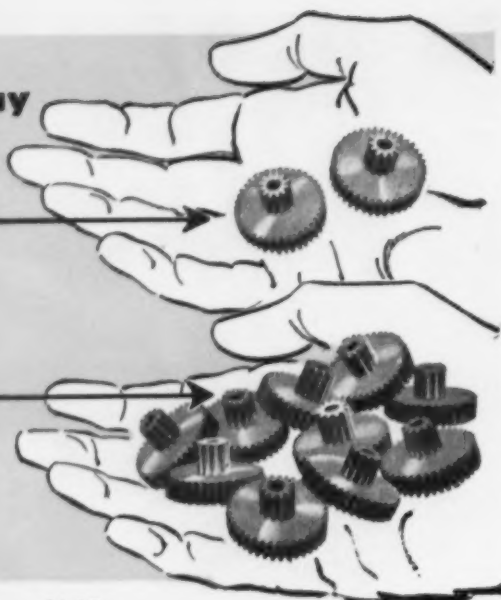
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\*Fiberboard expendable pallets licensed by Addison-Semmes Corp.

You can buy  
**THIS**  
or  
**THIS**  
for the  
**SAME**  
**DOLLAR**



TWO machined parts . . . \$1.00

TEN Powdermet® PARTS . . . \$1.00 (10¢ each)

## Don't cut parts—*Cut Costs* with **YALE Powdered Metal Parts**

Yes, powder metallurgy has an important price story—because when you save the extensive and costly operations involved in machining, it shows up in *more parts* and lower production costs!

But at Yale & Towne, there's another story of *equal* importance . . . *complete* engineering service, the kind you can trust—from consultation through production and delivery of parts that are *really* right!

Engineering service has given Yale & Towne its position of leadership in powder metallurgy. We are careful to *recommend only applications where Powdermet® parts will perform successfully*. Then, in design

and production of these parts, Yale & Towne offers the experience, know-how, modern facilities and creative ingenuity that *assure* best results.

As a part of this complete engineering service, Yale & Towne maintains a continuous special training program for well-qualified engineers. These men become Powdermet® consultants—available to discuss the advantages and limitations of Powdermet® parts *right in your own plant*. They will show you how Powdermet® may cut your production costs and improve your product. And there is *no obligation* for this engineering counsel.

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of Yale & Towne's skilled engineering assistance on your powdered metal problems.

Arrange for a visit by a Yale & Towne consultant—today!

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### FREE TECHNICAL LITERATURE

#### Low-temperature brazing

Brazing output can be raised with the low temperature silver brazing alloys Easy-flo and Silfos. Examples which show the advantages to be gained are described and illustrated, showing how brazing can be reduced to "push-button" simplicity. *Handy & Harman.*

For free copy circle No. 11 on postcard, p. 117.

#### Autopositive paper

How Kodagraph Autopositive paper is being used for engineering drawing reproduction in business and industry is told in a new brochure. It includes seven case histories which tell in detail of the techniques employed by firms in using the product. Suggested uses for the paper are: to protect original engineering drawings, reclaim old drawings, improve legibility of prints, speed revision of drawings, simplify print distribution, and widen print services. *Graphic Reproduction Sales Div., Eastman Kodak Co.*

For free copy circle No. 12 on postcard, p. 117.

#### Efficient handling

A booklet which illustrates how to store materials efficiently has just been published. In addition to the savings realized in the storage of materials, lift trucks have speeded truck and car unloading 87%, and permitted outgoing carriers to be unloaded in one fourth the time required before for loading. Readers may secure the complete story on this operation. *Towmotor Corp.*

For free copy circle No. 13 on postcard, p. 117.

#### Basic-lined cupola

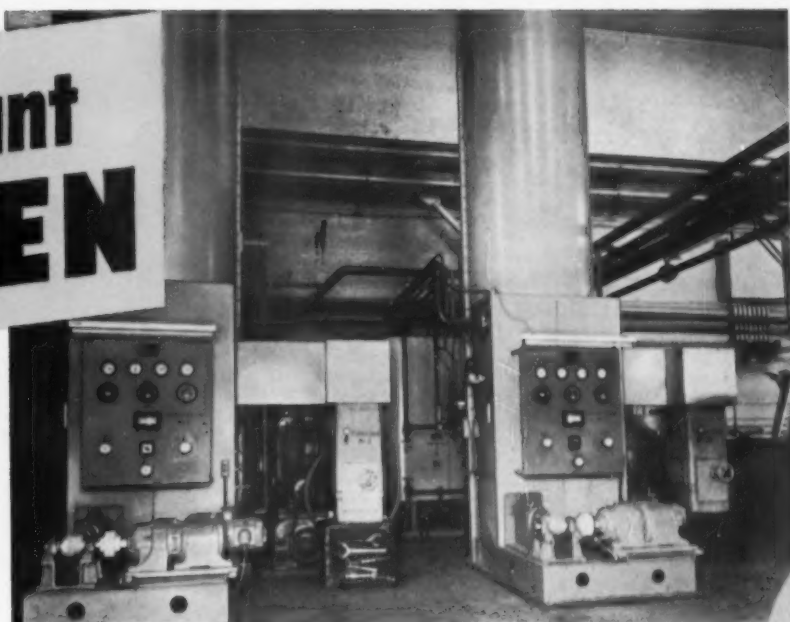
A leading producer of granular basic refractories announces a new booklet on operating practices with the basic-lined cupola. As a result of the greatly increased interest in special cast irons, the many advantages of basic cupola operation are now being more fully recognized. Of particular interest is a discussion of lining installation and maintenance procedures. Certain operating difficulties and their corrective measures are explained. *Basic Refractories, Inc.*

For free copy circle No. 14 on postcard, p. 117.

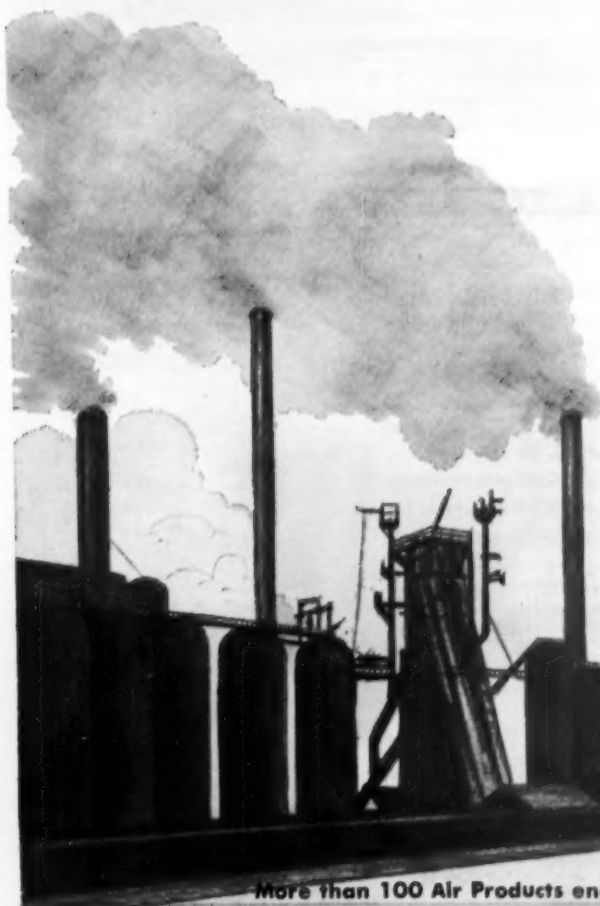


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with *Air Products* "On-Location" Generators



Plentiful, low-cost oxygen has become tremendously important in modern steel-making. With free raw material in infinite abundance in the air around us, it is only common sense to have equipment that will convert this unlimited asset into valuable oxygen. It is done without capital investment by installing an Air Products Multiple Generator on a lease basis.

When you make your own oxygen on your premises, you have no transportation costs . . . no worries regarding delivery failures or shortages . . . your oxygen requirements are piped directly from your own generator to all the points in your plant where it is needed.

Air Products, Incorporated, provides equipment for all requirements with:

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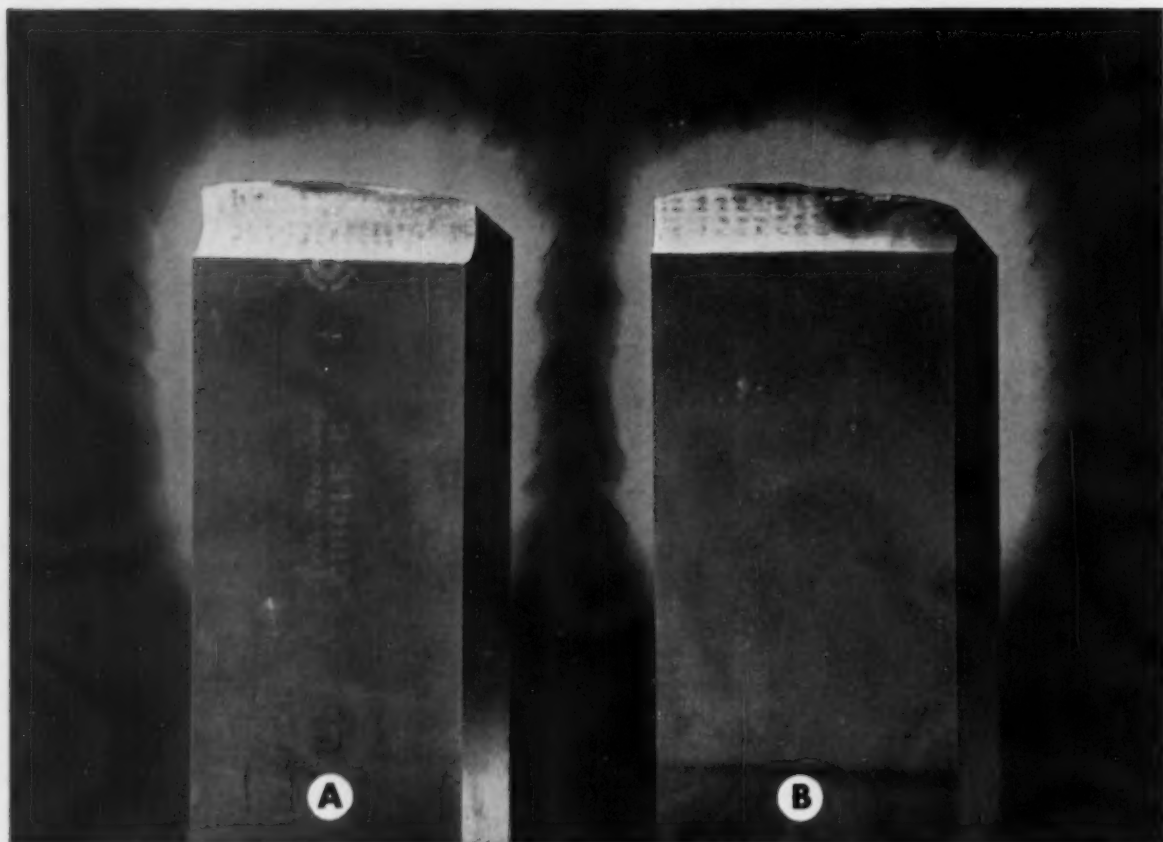
Let us have your requirements. We will be glad to give you actual figures showing savings you can make.

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More than 100 Air Products engineers are at your service.

**Low-cost OXYGEN . . . NITROGEN**



## which tool cut leaded steel?

● Right! The answer could only be Tool A which was used on leaded Aristoloy—4140. Tool B was used on non-leaded Aristoloy 4140 under the same conditions.

A comparison of the cutting edges of both tools demonstrates how the freer machining characteristics of leaded steels increase tool life and thereby reduce machining costs. The lead addition acts as a lubricant reducing friction between chip and tool. Tools therefore operate at lower temperature, contribute to better chip formation and eliminate damaging tool edge build-up.

Why not find out what advantages leaded steel can offer you? Call your nearest Copperweld office today for complete information or write us direct.

### SEND FOR FREE CATALOG

If you would like specific information about application of lead steel to your product get in touch with your nearest Copperweld office or write us today.



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For export—Copperweld Steel International Company, 117 Liberty St., New York

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625 James Street  
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3102 Smith Tower  
Seattle, Washington

# FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 112

## Aftercoolers

A new 12-page bulletin on aftercoolers and separators for compressed air systems has been published. It was written to help top management, production heads and operating personnel minimize the hidden costs of compressed air systems. It offers suggestions as to the scope of realistic cost accounting of compressed air system, and includes helpful charts. *R. P. Adams Co., Inc.*

For free copy circle No. 15 on postcard, p. 117.

## Heating equipment

A handy selector guide for determining the type and size of heaters for various surface heating applications is offered. The 4-page guide shows which type of heater to use for specific jobs, how to determine heater rating, how to calculate heat-up time, and how to select thermostats and controls. *General Electric Co.*

For free copy circle No. 16 on postcard, p. 117.

## Product index

A complete list of products manufactured in the materials handling field is offered by the Market Forge Co. For ease of reference, the products index has been printed as a lettersize file folder which can be used, in addition to a ready reference for information about products, as an efficient means of filing catalog information for materials handling equipment. *Materials Handling Div., Market Forge Co.*

For free copy circle No. 17 on postcard, p. 117.

## Hydraulic feed unit

A bulletin on a hydraulic feed unit, a 3-way machine with five station indexing fixture, is available. The units, being self-contained, need only electrical hookup for operation from a remote control station, and may be mounted in any position to suit the requirements of the work. Specifications are given. *Defiance Drill Div., The Ohio Machine Tool Co.*

For free copy circle No. 18 on postcard, p. 117.

## Power transmission

A catalog illustrates and describes the Browning Poly-V Drive, a new development in power transmission. It has been proven over many months of active development and test application. This engineering catalog contains specifications on the hundreds of sizes of stock sheaves and belts, complete engineering data for design of drives, along with tables of hundreds of practical stock drive combinations already worked out for convenient selection. *Browning Manufacturing Co.*

For free copy circle No. 19 on postcard, p. 117.

## Metal surface preparation

A comprehensive booklet on the subject of solving problems in metal surface preparation has been prepared. There are sections on castings, stainless steel, production planning, on preparing castings for silver brazing, on the development of new processes in production applications, and on paint stripping made easy. *Kolene Corp.*

For free copy circle No. 20 on postcard, p. 117.

Postcard valid 8 weeks only. After that use 5/12/55 own letterhead fully describing item wanted.

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### Material handling

A new folder on overhead material handling, showing cranes and monorails, is offered. Illustrated are: crane interlocks, heavy duty track switches, one ton electric hoist trolley, ten ton motor driven trolley and electric hoist, etc. *Penn Crane-Rail Co.*

For free copy circle No. 21 on postcard, p. 117.

### Corrosion prevention

A 19-page booklet discusses all phases of VPI corrosion prevention and its applications. As a new manual, it brings together for the first time information on the hows, whys and wherefores of VPI that will prove informative and useful to industry. The booklet gives an explanation of vapor phase inhibitors and the chemical action that occurs to halt rusting on ferrous metals and aluminum. It cites specific cases of material and packaging cost-savings in industry through VPI usage and illustrates applications of the product. *Angier Corp.*

For free copy circle No. 22 on postcard, p. 117.

### Industrial tires

A bulletin on industrial tires that are precision made to eliminate slipping and give more traction is available. They fit any split wheel or flat base rim or wheel. This illustrated bulletin includes price lists and other data. *The Notat Tire Co.*

For free copy circle No. 23 on postcard, p. 117.

### Portable band saw

A bulletin which shows how you can replace hand hack saws and supplement your stationary equipment with a metal-cutting saw that is completely portable is offered. The new portable band saw cuts ferrous and nonferrous metals, plastics and problem materials, and is ten times faster than hand sawing. Illustrations show how it can be used in any position. *Porter-Cable Machine Co.*

For free copy circle No. 24 on postcard, p. 117.

### FOR MORE LITERATURE

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

### Metal catalog

A new thermostat metal catalog which outlines the manufacture of Truflex thermostat metal and presents information on the selection of thermal elements and their design is available. There are separate tables giving major mechanical and physical constants for 40 different types of thermostatic metals. *General Plate Div., Metals & Controls Corp.*

For free copy circle No. 25 on postcard, p. 117.

### Wire and ribbon

A booklet describing the facilities of Sylvania for the manufacture of fine wire and ribbon, wire and ribbon parts, and small parts plating has just been issued. The 12-page booklet, profusely illustrated, shows machinery which can cope with almost any kind of wire process problem. It also carries valuable chemical composition charts indicating percentages of base material used in the wire and ribbon. Testing procedures are outlined, and plating processes are described in detail. *Parts Div., Sylvania Electric Products Inc.*

For free copy circle No. 26 on postcard, p. 117.

### Grinding wheels

A bulletin on roll grinding wheels as used for regrinding operation for steel mill rolls, paper mill rolls and miscellaneous rolls is available. Included is a grain and grade recommendation table with special reference to alloy chilled iron work rolls and steel back-up rolls for steel mill application. *Simonds Abrasive Co.*

For free copy circle No. 27 on postcard, p. 117.

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THE IRON AGE

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Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 5/12/55

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# How fast CAN YOU PRE-HEAT AN 8" DIA. BRASS OR COPPER BILLET TO 1600°F.?



20 MINUTES



HALF-HOUR



ONE HOUR



FOUR HOURS

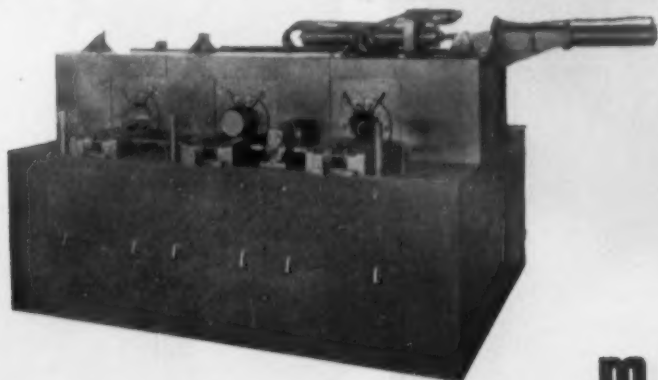
## COMPARE WITH WHAT IS BEING DONE WITH A MAGNETHERMIC LOW-FREQUENCY (60-CYCLE) INDUCTION HEATER

● The Magnethermic pre-heats an 8" dia. copper or brass billet every minute. Unusual? No. This speed explains why the copper and brass industry is taking a serious look at low-frequency (60-cycle) induction heating.

In addition to speed, the heater offers other operating advantages. Individual temperature control of each billet assures uniform heating of each billet. No chance of cold or over-heated ones.

A Magnethermic does not require warm-up time, eliminating scheduling billets far in advance. Space (8' x 10' average), is many, many square feet less than conventional heating equipment. Maintenance — nothing to maintain but the heating coils and those require infrequent attention.

Magnethermic pioneered low-frequency (60-cycle) induction heating. You can obtain complete information by writing, phoning or wiring your inquiry or request to Magnethermic. Prompt reply.



3-coil Magnethermic brass  
billet heater rated at 8,000  
pounds per hour.



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3990 SIMON ROAD

YOUNGSTOWN 7, OHIO

INDUCTION HEATING

60-CYCLE

## BALLS:

MADE OF STEEL,  
BRASS, BRONZE, MONEL-  
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# HOOVER

*The Aristocrat of  
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## BALL BEARINGS:

AMERICA'S ONLY  
BALL BEARING WITH  
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HOOVER BALL  
AND BEARING COMPANY  
ANN ARBOR, MICHIGAN

## TECHNICAL BRIEFS

### PACKAGING: Pumps In Cartons

Shipping, handling and warehousing costs were cut at Fairbanks, Morse & Co. through use of corrugated cartons to package pumps . . . Special box design used.

By packing its 3-gal tank household water pumps in corrugated cartons, Fairbanks, Morse & Co. achieves savings in materials handling warehousing and shipping. Eventual plans call for shipping pumps up to 42 gal tank capacity in similar boxes, made by Gaylord Container Corp., St. Louis, Mo.

Three-gallon tank pumps are placed on a 175-pt solid fibre base before going through the spray paint booth. From this point they progress on conveyors to the packing station where they are bolted on to the base.

#### Pump Is Well Braced

Next step is to place a sheet of specially treated paper over the tank top to avoid marring the paint. This paper is held in place by a die-cut sunburst opening which is part of the top lid. A small box containing parts is wired to the lid before it is positioned and instruction sheets are enclosed.

By the time the pump is ready to go into the outer shipper, it is

#### WANT MORE DATA?

*You may secure additional information on any item briefed in this section by using the reply card on page 117. Just indicate the page on which it appears. Be sure to note exactly the information wanted.*

braced at the top by the tray and at the bottom by the fibre base. Final step is to slip the pre-packaged pump assembly into the shipping container which is held in position by a special wooden jig. Closure is accomplished by stapling.

#### Use 350-lb Test Board

The corrugated box for 3-gal tank pumps is made of Gaylord's 350-lb test cylinder board and has inside overlapping flaps plus full overlapping flaps top and bottom. Hand holes are provided for easy handling. This style was adopted after extensive tests.



Sunburst opening . . .



Slips into carton . . .

## TECHNICAL BRIEFS

### Plating:

#### Electrolytic coating for magnesium studied by NBS.

A low-voltage alkaline chromate process for depositing protective coatings on magnesium alloys has been investigated by the National Bureau of Standards electrodeposition laboratories, under the sponsorship of the Department of the Army.

Coatings produced by this method provide protection against salt-spray corrosion equivalent to that of coatings obtained from other anodizing processes currently used. The NBS process is potentially more economical than the other methods, however, since it uses a low-voltage power supply and only two chemical constituents other than water.

#### May Aid Magnesium Use

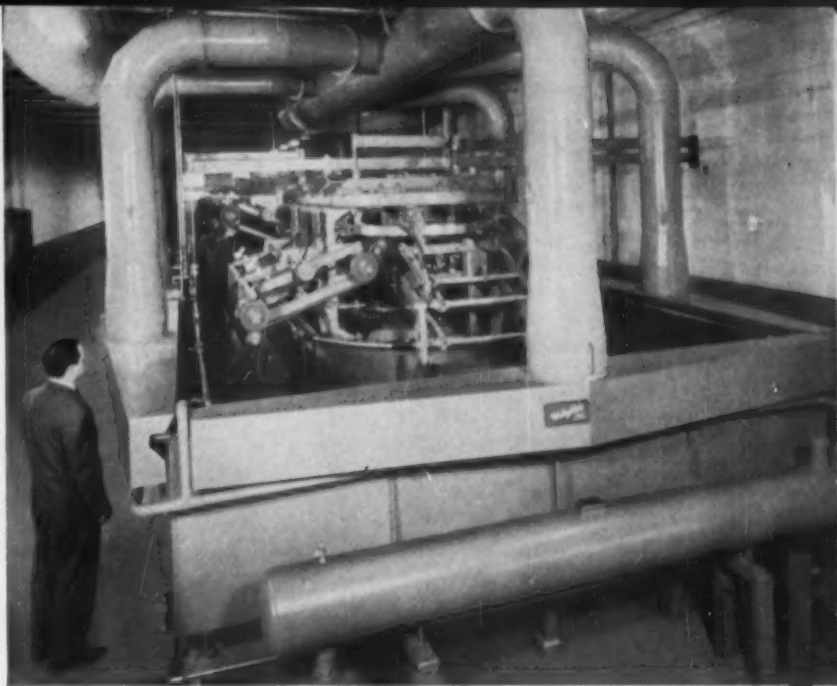
Lightweight, easily-machined metals are in increasing demand by industry, and magnesium is one of the most important, to become available in commercial quantities in recent years. The use of magnesium and its alloys is limited, however, by its low resistance to corrosion—salt-spray corrosion, in particular.

Protective coatings obtained from the bureau's simple alkaline chromate process should lead to wider utilization of magnesium alloys for lightweight equipment and for many aircraft and shipboard components where corrosive atmospheres prevent use of the uncoated metal.

#### Resembles Electroplating

The NBS process is similar to electroplating except that alternating current is used instead of direct current, and the coating is formed on both electrodes. Some material is deposited out of the solution onto the electrodes in the anodizing process, but the coating is mainly material formed by the chemical reaction between the metallic electrode and the components of the electrolyte.

The NBS method for coating magnesium alloys differs from the



## NEW TOP EFFICIENCY IN BARREL PLATING

### *Udylite Automatic Barrel Proves Its Flexibility and High Capacity in Actual Production*

The new Udylite full automatic horizontal barrel plating machine is a heavy duty, high production, return type unit, designed and built for any standard plating process.

Now in production plating, this new machine incorporates Udylite's years of experience as a foremost horizontal barrel producer plus Udylite's fully automatic engineering genius.

Special features include delayed set downs and skip transfers with complete operational control by the operator. Each cylinder can be raised or lowered independently of the rest. Electrical controls pre-determine desired number of cylinders per hour and time of cylinders in each bath. Speeds can be reduced in the post plate cycle. These and other features mean unheard of operational flexibility.

Get more facts about this new Udylite automatic barrel plating machine. Write for literature today or contact your local Udylite representative.

WORLD'S LARGEST  
PLATING SUPPLIER

THE  
**Udylite**  
CORPORATION  
DETROIT 11, MICHIGAN

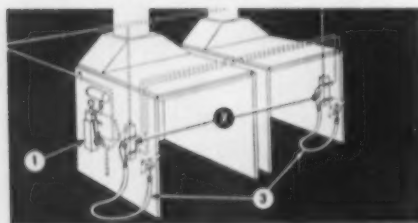


The Plumbers Woodwork Co. manufactures wood and plastic Badger Brand toilet seats. Using the DeVilbiss hot-spray system, in its enameling operations for wooden seats, savings have been nothing short of spectacular.

## Plumbers Woodwork increases paint mileage 94% with new DeVilbiss paint heater



This one DeVilbiss Water Heater serves all four spray stations at Plumbers. To add another station, a low-cost heat exchanger, gun, and hose are all that are needed!



DeVilbiss hot-spray system is foolproof; adapts to multiple gun hook-ups. Heated water from master water heater (1) heats paint in heat exchangers (2); heat-jacketed hose assemblies (3) keep paint hot right up to guns, assuring uniform viscosity at all times at each gun.

"Since installing a DeVilbiss hot-spray system, production costs have been cut remarkably, and we're getting a better paint job," says Fred Mueller, president of Plumbers Woodwork Co., Algoma, Wisc. "With one coat, we get complete coverage — faster drying, and a tougher, glossier finish.

"Paint stays hot right up to the guns, and we add no thinner. Overspray has dropped to a fraction of that of our former cold-spray method. Now, we apply pure paint to our wooden seats — without runs or discoloration.

"What's more, the DeVilbiss paint heater lets us reduce air pressure by two thirds — providing big savings in power, equipment replacement, and maintenance. Even more impressive, however, are spray-material savings. For now, one gallon of paint covers 97 pieces, compared to 50 pieces with cold spray — an increase of 94% in paint mileage!"

★ ★ ★

Why not call a DeVilbiss representative, today, to survey your finishing operations — show you the way to better finishing at lower cost? The standard components of the DeVilbiss paint-heating system can be combined in countless ways to meet your special needs.

### THE DEVILBISS COMPANY

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## DEVILBISS



SPRAY GUNS • AIR COMPRESSORS • HOSE AND CONNECTIONS • TRANSFORMERS • SPRAY BOOTHS • ACCESSORIES



acid chromate and the HAE anodizing processes in two respects: (1) it operates at a much lower voltage—usually 10 to 12 volts ac, and (2) the electrolytic bath contains only two constituents other than water—sodium or potassium hydroxide and the corresponding chromate.

#### Smooth, Gray-Green Coat

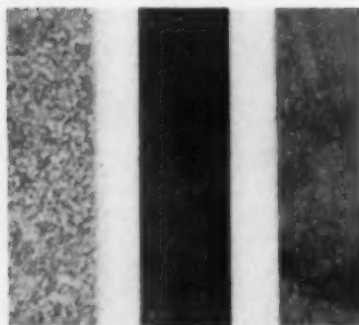
In the process, a current of 80 to 140 amp per ft<sup>2</sup> is passed through the bath 20 to 40 minutes, at a temperature of 150 to 170°F. Under these conditions, a coating 1 to 2 mils thick will form on the magnesium alloy electrodes.

The coating is smooth and gray-green in color, but not as uniform in appearance as either the HAE or the acid chromate coatings. The surface exhibits some sheen if the initial surface is very smooth.

Gas adsorption measurements (Brunauer-Emmett-Teller method) reveal that the coating has a smaller effective surface area than HAE coatings. If anodized panels are bent or flexed, then the coatings crack on the tension side of the bend and chip or shatter on the compression side.



Laboratory setup . . .



Specimens compared . . .

May 12, 1955

While the coating distribution is not as uniform as those produced by processes requiring higher voltages, such as the HAE process, it is more even when suitable racking procedures are used.

Complete coverage can then be obtained over a limited range of temperature for a given current density. For example, if the process is operated at 80 amp per ft<sup>2</sup>, a temperature of 60°C is required to obtain complete coverage of specimen panels.

At lower temperatures, the panels remain bare near the edges. At higher current densities, the minimum temperature required for complete coverage is higher. However, indications are that temperatures above 75°C yield coatings having poorer corrosion protection.

#### Resists Salt Spray

The work at the Bureau shows the outstanding characteristic of coatings produced in these alkaline chromate baths to be resistant to salt spray corrosion. Corrosion resistance of coatings from many baths of various compositions, including the HAE and the acid chromate, were compared with those of coatings produced from this newly developed bath.

When the test specimens were exposed to salt spray in equipment operated according to Federal Specification QQ-M151 for 12 days, the coatings applied by the alkaline chromate bath appeared to be the most resistant.

#### Effect of Current Variations

The salt-spray protective value of the coating is controlled by the current density and bath temperature. Variations in current between 80 amp per ft<sup>2</sup> and 140 amp per ft<sup>2</sup> have little effect on the corrosion resistance, but lower current densities yield coatings of inferior protective value.

Increasing the temperature above that required for complete coverage also tends to reduce the protection against salt spray. Direct current has been used in this process to produce uniform coatings on panels in solutions of appropriate composition.

## 22.6% more air per power dollar



**Floating tank mount on DeVilbiss compressor outfits completely eliminates weld strains on the air tank. Heavy steel bands gird the tank, acting as a reinforcement, as well as a very solid anchor, between the compressor mounting and the four base legs.**

The efficiency of DeVilbiss air compressors means higher actual delivery—as much as 22.6% more air per power dollar than most other compressors. Many times, DeVilbiss outfits pay for themselves through lower maintenance and depreciation costs.

In addition to the tank mount, every DeVilbiss compressor includes these features: A.S.M.E.-approved air tank, check valve manifold, automatic pressure switch, diamond-bored pistons, cylinder head with removable valves, quality electric motor or gas engine.

If you have compressed air problems, let your local DeVilbiss jobber analyze your needs.

#### THE DEVILBISS COMPANY

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Santa Clara, Calif. • Barrie, Ontario  
London, England  
Branch Offices in Principal Cities

FOR BETTER SERVICE, BUY

**DEVILBISS**





## soldering time saved!



**KESTER FLUX-CORE SOLDER** saves plenty of time on every job because it's work-formulated to increase soldering speed and efficiency. That's why everyone's switching to Kester . . . the right name to remember for top quality solder.

**THIS IS IT . . .** the informative 78-page Kester textbook "SOLDER . . . Its Fundamentals and Usage." Send today!

# KESTER SOLDER

**COMPANY** 4215 Wrightwood Avenue, Chicago 39, Illinois  
Newark 5, New Jersey • Brantford, Canada

## New Books:

*"Titanium in Iron and Steel"*, by G. M. Comstock, the third in the series of Alloys of Iron monographs, provides both a critical review and a comprehensive correlation of significant data on titanium as an alloying element in iron and steel.

In addition to the author's more than 40 years of experience in the field of titanium alloy, the book also has the advantage of a vast bibliography.

The book covers a number of specialized applications of titanium additions and their effects in cast irons and cast and wrought steels. Titanium as a carbide stabilizer and its contribution to precipitation hardening are covered.

Every significant phase of our knowledge of titanium as an alloying element in iron and steel is reviewed in a manner that makes it unnecessary for the reader to engage in time-consuming research in order to achieve comprehensive coverage of the subject. John Wiley & Sons, Inc., 440 4th Ave., New York 16. 294 p. \$6.00

*"Protective Coatings for Metals"*, by R. M. Burns and W. W. Bradley, is a new edition of Burns' original monograph. Greatly enlarged and containing many of the significant developments of the 15 years since the publication of the former edition, this book provides a series of highly informative sections on corrosion inhibitors, chemical conversion coatings, sprayed metal coatings, and evaluation of organic coatings in general.

Here is an indispensable handbook for everyone concerned with the technology of corrosion control. Reinhold Publishing Corp., 430 Park Ave., New York 22. 643 p. \$12.00

*"Helical Spring Tables,"* by J. D. Gayer and P. H. Stone, Jr., makes it easier to design and specify springs. Contains an index to over 6800 ready-designed compression and tension springs. The Industrial Press, 93 Worth St., New York 13. \$5.00. 175 p.

## TECHNICAL BRIEFS

### Lubrication:

#### Soluble cutting oil for fast cooling.

A new water-soluble cutting solution ingredient for use in all types of machine tools is made entirely of synthetic ingredients, and is said to offer several advantages over conventional petroleum-base cutting fluids.

One claim for the new Dromus Oil E, made by Shell Oil Co., is that it has exceptional cooling properties. Higher speeds and feeds are claimed possible, resulting in greater production rates.

#### Solution Is Stable

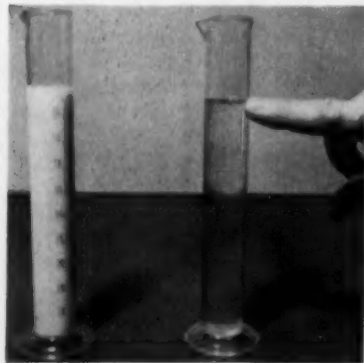
The product actually dissolves in water to form a true solution instead of an emulsion. Even on long standing, no separation is noticeable. The solution is stable at all temperatures normally encountered.

The ingredient may also be mixed with a large volume of water for a very high cooling effect. Its addition to water is said to prevent rusting of parts or equipment; also to improve the wetting characteristics of the solution to reduce friction between tool and chip and to increase cooling still further.

#### Won't Spot Clothing

Because of its almost clear color the new synthetic cutting fluid will not leave oily or greasy deposits if it spatters on clothing.

Another claim is that a properly prepared solution will not froth or foam objectionably, or form hard-to-clean sludge. Chips and grind-



Forms true solution . . .

## thumbs down on high handling costs

A Conco Crane, custom-designed for a specific application, can cut costs sharply. A modest crane investment can return important profits. Let a Conco engineer show you how.

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BOOTH  
2040-  
2042



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Conco Engineering Works — Domestic Heating Equipment  
Conco Building Products, Inc. — Brick, Tile, Stone



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abrasive life  
you want...**



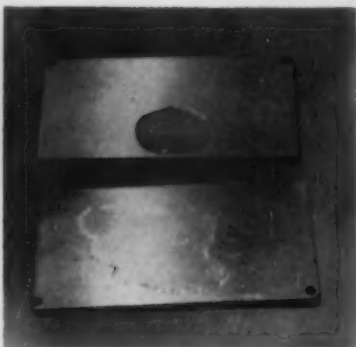
TRU-STEEL lasts longer than ordinary steel shot. It *should* last longer because it's not only heat-treated, but drawn to exacting tolerances. Tru-Steel saves on machine parts, too, because it will not break down into fines that cause wear... *controlled chemistry, plus painstaking control checks give Tru-Steel the right hardness for fast, thorough cleaning.*

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#### TECHNICAL BRIEFS



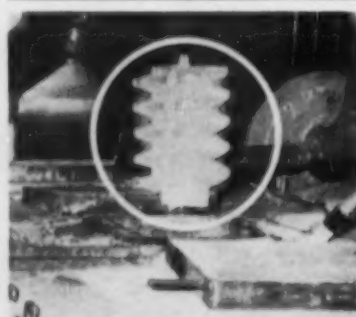
#### Greater wetting action...

ing grits settle out rapidly so that most of these are not recirculated through pumps and cooling systems. If the machine is to be cleaned or dismantled, the clear coolant may be syphoned off the top and reused.

#### Mix in Any Ratio

The formula includes more than a dozen ingredients, each having a specific function to perform. It may be added to water, or water to it, in any ratio without fear of inversion or instability.

For metal cutting machinery such as lathes, boring mills, drill stands, milling machines, and the like, a solution of thirty parts of water to one part Dromus Oil E is recommended. Depending on plant experience, this ratio may be changed to as high as 40:1 or as low as 20:1. For grinding machines of all types, the dilution may be even higher, 50:1.



**TRANSFERRING** an unground high speed steel gear hob from high heat salt bath to quench salt. Hob weighs 212 lb, was made from a 562-lb forging of M-2 type steel. Photo courtesy Illinois Tool Works, Latrobe Steel Co.

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## TECHNICAL BRIEFS

### Refining:

**New technique traps metals in self-made cage.**

Scientists at the Westinghouse Research Laboratories are purifying titanium and other hard-to-get metals by imprisoning the molten metal inside a cage of its own making.

The process, called cage zone refining, uses a unique method to melt a bar of metal while it acts as its own crucible, thus preventing contamination by any containing vessel. Object of the process is to prepare super-pure metals.

#### Aids Transistor Research

Zone refining, in which a bar is melted progressively from one end to the other, has become a standard process for purifying certain metals. It is used routinely in transistor research to prepare germanium metal having impurities of about one part in 10 billion. The new technique applies this refining process to metals which are so active at high temperatures that they react with any sort of crucible in which they are heated.

The success of zone refining depends upon the fact that most impurities in metals have a preference for either the liquid or solid state of the metal. Iron, a common impurity in titanium, has a preference for liquid titanium over the solid metal.

#### Melted Progressively

When a bar of impure titanium is melted progressively from end to end, the iron tends to concentrate in the liquid titanium and remain there as the solid metal "freezes out" behind it. Thus the iron is "swept" to one end of the bar as the molten zone moves along.

Each time the process is repeated, more iron is carried to the end of the bar. This end then is cut off and discarded, leaving the rest of the titanium bar more pure. Heating is done electromagnetically by passing the bar through a coil which carries high-frequency alternating current.

Specify  
*Michigan* Tubing  
for economy and versatility



This gasoline tank filler tube has the overflow pipe brazed to the filler tube at two points and the fastener clamps projection welded to the tube. The cam is spot welded to the tube mouth.



Vacuum cleaner handle with cord holder welded to tubing and elongated hole punched for interior wire and tumbler switch, ready for chrome finish and assembly to the vacuum cleaner.



The muffler inlet pipe above shows how Michigan workmanship performs several intricate fabricating operations to most exacting tolerances.



The meticulous workmanship that goes into every piece of Michigan tubing is well illustrated by this washing machine center tube shaft where absolutely accurate finishing to the closest tolerance is required.

## ROUND

1/4" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
3/8" to 3/4"	16 thru 22	3/8" minimum
3/4" to 1"	11 thru 22	side to 5"
1" to 2"	11 thru 20	maximum side
2" to 3"	11 thru 18	

Carbon 1010 to 1025

### For almost 40 years

Michigan has been manufacturing tubular parts for leading manufacturers. This acceptance of Michigan tubing has been won by meticulous attention to customer requirements and the supplying of the very best in tubing. The following advantages of low cost manufacture and utmost dependability are yours when you specify Michigan for tubular parts in the fabrication of your products.

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2. It is always of uniform strength, weight, ductility and weldability;
3. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted and rolled.
4. It can be formed or machined in your plant or prefabricated at Michigan.

### Consult Michigan

for engineering and technical help in the selection of tubing best suited to your needs.

**Michigan** IN ELECTRIC **STEEL TUBE PRODUCTS CO.**

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RESISTANCE WELDED STEEL TUBING

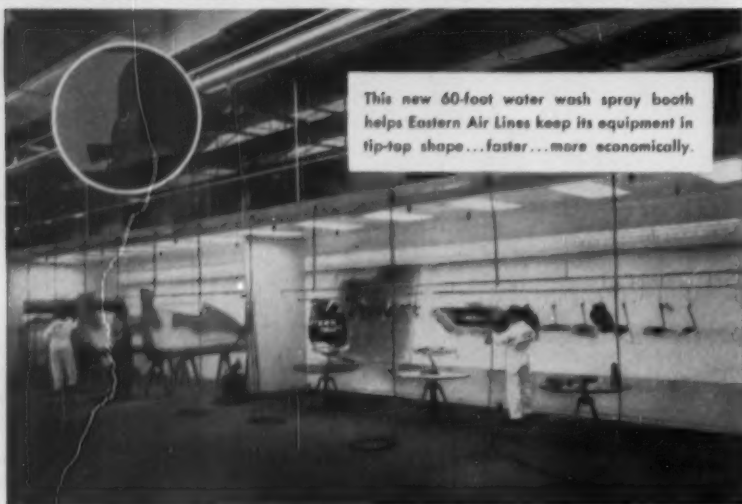
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## WHAT'S NEW in spray painting booths?



Sold by Binks Jobber Jerome A. Taudt Co., Inc., Miami and West Palm Beach, Florida.

Referring to its new Binks Spray Booth  
Eastern Air Lines says:

**"The ventilation is very good and the  
five-time washing of the air is excellent"**

"We in Eastern Air Lines have found our new Binks spray booth to be quite satisfactory. It has been able to handle all types of our work. The ventilation is very good, and the water system, water curtain, and five water washes of the air are excellent."

These are the words of W. S. Tefft, Superintendent of Plane Overhaul at Eastern Air Line's offices in Miami, Florida. The equipment is a 60-foot Binks Dynaprecipitor Water Wash Spray Booth designed to accommodate everything from sizeable plane assemblies to the smallest of parts.

All paint overspray and fumes are drawn into the booth on a steady stream of air that does not cause any "drift." The contaminated air is scrubbed thoroughly 5 times before it is exhausted out-of-doors...free of paint.

Booths of this kind are fully approved by local authorities and by the insurance companies. They not only make for much cleaner and healthful working conditions in the shop, but also speed up finishing and lower maintenance costs. Down time for cleaning is reduced to a minimum because the paint is washed out of the air and is collected in the water pan for easy reclamation or disposal. Exhaust fans stay cleaner and balanced.

### FOR INFORMATION OR HELP

Binks engineers are always ready to help you get more out of your spray painting equipment. They will survey your finishing department and give you their suggestions without obligation. Just contact your nearest Binks office or write directly to:

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**Eddy currents flow  
against electrical resis-  
tance of metal causing  
it to melt . . .**

Titanium has a high melting point — more than 3000°F — and at this temperature it is one of the most active metals known. It reacts chemically with air, and with metal, graphite, or ceramic containers. The new technique eliminates such sources of contamination during refining.

In a low-pressure, inert atmosphere of argon or helium, a square bar of impure titanium stands on end on a metal platform. The platform is slowly raised, lifting the bar lengthwise through the heating coil.

A high-frequency current at 10,000 cps flows in the coil and induces large electric currents inside the bar. These currents, called eddy currents, flow against the electrical resistance of the metal, causing the bar to melt from the inside.

### Impurities Cut Away

The four corners of the bar are less affected by the induced currents and rapidly lose what heat they possess to the surrounding atmosphere. Therefore, the corners do not melt, but act as a cage within which the molten titanium is "imprisoned."

The molten zone moves along inside its cage as the metal bar progresses through the heating coils. After the impurities are concentrated at the end of the bar, this end and the impure corners are cut away.

In one variation of the new Westinghouse process, a round bar is machined so that several ridges or fins run lengthwise along its surface. These unmelted ridges then form the cage, and since they can be placed at will, they permit longer bars of larger diameter to be purified. The scientists foresee the technique being applied to bars as much as three inches in diameter and of any desired length.

## TECHNICAL BRIEFS

### Steelmaking:

Induction heating of ingots for rolling proves practical.

The first steel ingots ever heated by electric induction flashed red hot through the rolls at Western Canada Steel's Vancouver Rolling Mills. This new process cuts the time for heating steel ingots by about 75 pct, increases production 30 pct, and reduces fuel costs by \$1 per ton.

Where it previously took about 45 minutes to heat ingots in the oil-fired furnaces, it now takes from 8 to 12 minutes to get them red hot in the twin-tube electric induction unit. The furnaces have a total capacity of 10,000 hp, and a direct line from the power plant feeds in 60,000 v to provide this energy.

#### Split-second Timing

The induction heating unit comprises a series of large copper coils set in refractory blocks placed end to end to form a tunnel. Ingots are fed in at one end of the tunnel, pushed slowly through, and emerge at the other



Induction heating unit . . .



Red hot ingot . . .

May 12, 1955

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for automatic muscle jobs  
like these...

**T-J**

**Spacemaker**  
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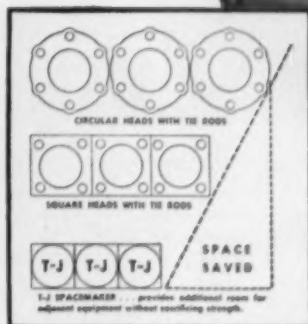
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Lock	Time
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Grind	Sequence
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Squeeze	Form
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Coin	Feed
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Brace	



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PNEUMATIC, AIR AND HYDRAULIC CYLINDERS, CUTTERS, CLIMBERS



end almost white-hot, ready for rolling into finished steel bars.

The heat produced is so intense that if the ingots were left in the furnace for even half a minute too long, they would melt. The whole operation is one of split-second timing. Unless the gigantic magnetic forces employed are delicately balanced and harnessed, red-hot ingots weighing up to 800 lb could fire out of the tubes

onto the rolling mill floor like torpedoes.

#### Tunnel Divided

The tunnel is divided into two portions. The first, the low-temperature half, uses low-frequency alternating current of 60 cycles. In the second half, where maximum heat is obtained, a frequency of 600 cycles is required. This 600-cycle power is supplied by a

huge 5700-hp motor-generator. A separate 400-hp motor is needed just to start it.

The heart of the furnace operation is the control pulpit. This is a square aluminum cabin placed directly over the tunnels, where one man supervises an impressive array of dials and instruments recording the findings of delicate electronic measuring devices.

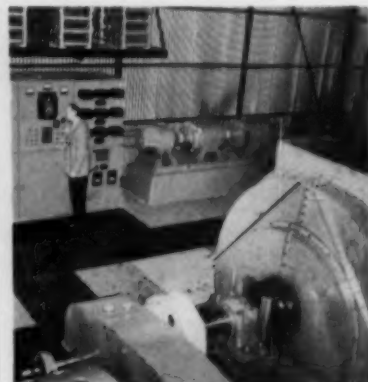
#### Matches Mill Production

Controlling the flow of steel through the heating tunnels at a speed of about one ingot every 20 seconds, the operator must match this flow to the rate of production of the rolling mill so that ingots are at just the right temperature for rolling when they run down the conveyor.

When the red-hot ingot emerges from the tunnel onto an automatic conveyor, it is fed into the first set of rolls, which is a 16-in break-down mill. The fiery ingots, which are about 4½ ft long and 5 in. in diameter, get progressively longer and thinner as men pass them in and out of a series of rolls.

#### Automatic Equipment Used

In about 3 or 4 minutes, they have obtained a length of about 200 ft and can be reduced to as little as one-eighth of an inch in diameter. When they emerge from the last rolls, en route to the "hot bed" for cooling, they travel up to 1000 fpm. Their journey is largely controlled by automatic and semi-automatic equipment.



Generator: 5700 hp . . .



### Foaling a new Champion

A new champion has been added to the Axelson family of machine tools by the purchase of the Fray Milling Machines and Milling Attachment from the Fray Machine Tool Company, Burbank, California.

Axelson will manufacture the milling machines and milling attachments with the same special skills and craftsmanship that have made Axelson Heavy Duty Lathes world famous for outstanding quality.

May we give you more information?

**Axelson**  
Milling Machines

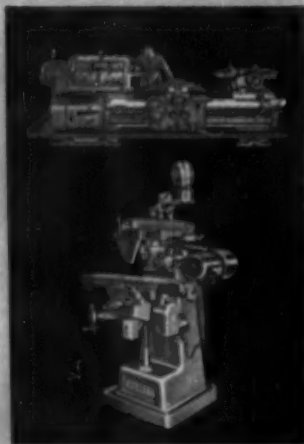


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## TECHNICAL BRIEFS

### Corrosion:

Underground rate can be reduced.

A National Bureau of Standards study shows that some bolt materials can be protected against corrosion by making them cathodic to the structures which they fasten.

When iron or steel is exposed to the soil, local differences in electrical potential develop at the surface of the metal to form numerous small corrosion cells. Electric currents flow through the soil from certain areas (anodes) to areas of less negative potential (cathodes), with accompanying loss of anode metal. If a bolt becomes anodic to a structure, it will fail more rapidly than the surrounding metal because of the comparatively large differences in area.

#### Sharp Edges Boost Rate

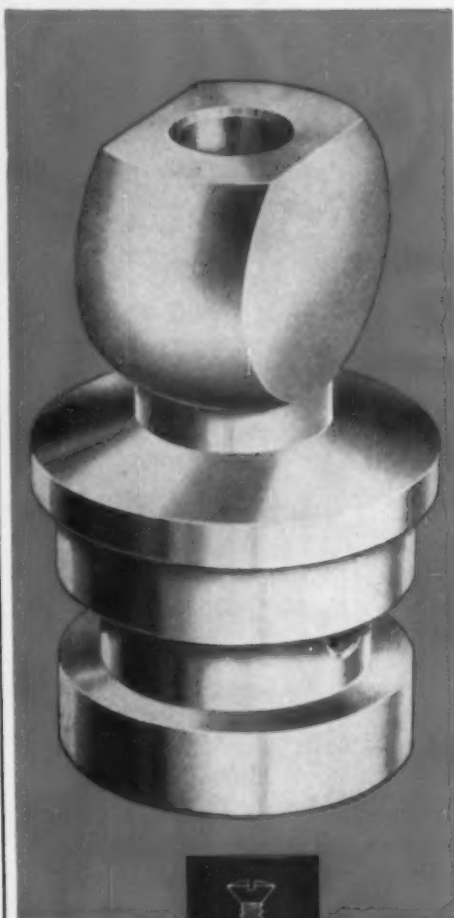
Presumably, bolts and structures made of the same materials should corrode at the same rate. However, it is believed that the many sharp edges on the surface of bolts accelerate the corrosion rate. And, when the soil is packed more tightly around the bolt than around the adjacent structure, corrosion may be further accelerated.

Workers have found that the addition of 1 pct copper to cast iron bolts reduced their corrosion when coupled with plain cast iron. Investigators also suggested the use of a small amount of nickel in ferrous bolts. As extensive use of low-alloy bolts would not result in prohibitive installation costs to industry, such bolts were arbitrarily chosen for the main laboratory study.

High-alloy cast-iron and nickel-copper alloy (70-30) bolts, known to be cathodic to plain cast iron but relatively expensive, were also used.

#### Exposed for One Year

To determine what electrical measurements might be of value in predicting probable bolt behavior, potential measurements were made on bolts joined with sections



TWIN-FAST SCREW



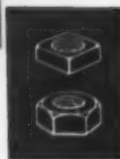
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In steel, brass, or other metals... from 1/16" to 2 1/4" diameter are simple production runs at Blake & Johnson.

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Standard Hex Socket

The large openings at the six corners of the hex allow Apex surface drive sockets to drive against the centers of the flats of hex head fasteners, rather than against the corners.

On plant and equipment maintenance work, where nuts and bolts are frequently removed and replaced, Apex surface drive sockets prevent excessive wear and damage. This broaching design also allows the socket to slip on the head of the bolt or nut quickly and easily, saving additional maintenance time.

Surface drive sockets are just one of the many types of Apex nut running tools. If your nut running operations call for impact tools, Apex can furnish sockets, extensions, adapters and universal wrenches specifically designed for this type of work. Or, if you need sockets for high-speed production, Apex can supply these, too.

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TOOLS

sockets, extensions, adapters

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## **Couples exposed to very corrosive soil for one year . . .**

of pipe. This was followed by exposure of these couples to a very corrosive soil for 1 year. Potentials and currents were measured during the exposure period, and weight losses were obtained at the year's end.

The reduction in weight loss of the coupled (cathodic) bolts compared to the uncoupled control samples ranged from 53 to 93 pct. The data indicated the beneficial effects of relatively small amounts of alloying constituents, particularly 1.5 to 2 pct nickel. The cathodic nature of high-alloy cast-iron and nickel-copper alloy resulted in almost negligible corrosion of these bolts.

### **Larger Currents Better**

The electrical measurements were correlated with weight losses at the end of the investigation. It was found that, for bolts made of materials having similar rates of corrosion, the larger galvanic currents generally provided for better bolt protection.

The effect of exposure time on the corrosion rates of the various bolts was also studied. In general, at the conclusion of the laboratory exposure all of the bolts were corroding at a lesser rate than previously.

### **Study Graphite Effect**

An additional study was made of the probable effect of replacing bolts in cast-iron structures in which graphitization has occurred. In this work two specimens were cut from pipe sections that had been exposed to corrosive soil for 13 years and had become graphitized. These were exposed in the laboratory for about 9 months along with two previously unexposed cast iron specimens.

Upon initial exposure the graphitized specimens were cathodic to the ungraphitized specimens by as much as 400 millivolts, but for the final 60 days of exposure

## TECHNICAL BRIEFS

### Steel with 5 pct Cr a good bolt material . . .

the potential difference averaged about 15 mv. Even though this potential difference appears to be small, plain ferrous bolts used as replacements on cast iron structures would corrode rather rapidly because of the area relationship.

However, steel containing 5 pct of chromium was found to be cathodic to unalloyed ferrous material by about 50 mv, indicating that it might be a desirable bolt material, especially for replacement purposes.

### Forming:

Portable unit straightens dents in tanks.

An airplane's wing-tip tanks, like car fenders, are constantly exposed to dents. Straightening such dents was expensive and usually meant the tank had to be cut to pieces. Now the Martin plant at Baltimore has developed a vacuum technique which pulls the dents out to the original smooth aerodynamic contours. The equipment is portable; it can be used at the airport, in the shop, or in final assembly.

#### Dents Pop Out

A plate, formed to the contour of the tank, is placed over the dent and sealed with a sponge rubber gasket. Connections are made to a two-stage vacuum pump; vacuum is applied, and the dents pop right out. Even deformed stiffeners or stringers under the dented skin are straightened by this method.



Taking out dents . . .



The above Knurled Head Machine Screw represents another difficult cold heading job successfully accomplished at lower cost per unit by Keystone "Special Processed" Cold Heading Wire.

The superior grain flow characteristics of "Special Processed" Wire provide the desired upsetting and die forming qualities necessary to form the thin head section without cracking. The structural soundness and uniformity of "Special Processed" Wire further proved itself by trouble-free machine operation, longer die life and a finished product of the highest quality.

On your next recessed head or other difficult cold heading job, try "Special Processed" Wire. See your Keystone representative or write for more information.

  
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Not one strip rolling requirement in ten need be carefully "miked" to assure close width tolerance.

But that exceptional job is routine with Somers THIN STRIP. Monel, pure Nickel and Nickel alloys are rolled to within  $\pm 5\%$  from .010" to .00075", with the same degree of accuracy in widths, and with the exact properties required by your product.

Modern rolling, annealing and precision control equipment assure uniform high quality under the most rigid specifications.

And Somers 40 years experience in a wide range of applications is available to help solve your strip problem without obligation.

Write for confidential data blank or field engineer.



Somers Brass Company, Inc.  
WATERBURY, CONN.

#### TECHNICAL BRIEFS

### Diemaking:

Cast beryllium copper dies for forging now feasible.

Cast beryllium copper dies may soon be used for forging of large steel, aluminum, and magnesium aircraft parts. Advances in design and foundry techniques now permit casting the dies in larger sizes and with longer life than previously was thought possible for dies of this type.

#### Coating Cut Die Costs

The Beryllium Corp., Reading, Pa., produced most of the beryllium copper dies tested in an experimental forging die program being conducted by North American Aviation, Inc., and Wyman-Gordon Co. Casting of the forging dies—instead of machining the die cavity out of a steel block—reportedly cut aircraft delivery time and reduced die costs by as much as 75 pct.

#### Goal In Sight

The ultimate goal is the application of this low cost forging technique to larger aircraft parts and structural sections. This goal is now in sight due to the following advancements in design and metallurgy.

Improved techniques to obtain properties for long die life.

Improved die surface finish which reduces final machining.

Better frictional properties of casting alloy so that galling and need for lubricant are virtually eliminated.

Application of a special beryllium alloy as a die material for forging titanium, which must be run at higher temperatures than the standard aircraft alloys.

#### Dies Quickly Reproduced

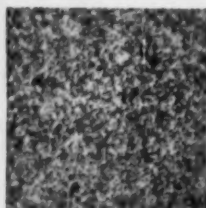
In addition to reduced die costs and forging lead time, the use of cast forging dies permits other economies. At the end of a production run, the die metal can be melted down for re-use. Instead of a heavy steel die, the press shop stores the die pattern which can be used later to quickly produce another set of dies when needed in production.



thin strip brass  
for  
deep drawing



Uniform fine grain size of Somers crystal brass—less than .010 mm. (75X).



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**Fine Grain Finish**

Somers Brass Company is pleased to announce the availability of a new, unique annealing process which makes possible a uniform fine grain of less than .010 mm. which can be drawn to full 40% elongation.

Developed in cooperation with the Selas Corp. of America this new process makes it possible to deep draw Somers THIN STRIP and still obtain a fine grain which is easily buffed to a brilliant finish.

And this new Selas Furnace provides high production as well as close control of temper and uniformity. It is typical of the modern equipment with which Somers produces copper, brass and other alloys to rigid specifications between .010" and .00075".

If you have a problem with thin strip, let Somers experience help you. Write for confidential data blank or field engineer.



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WATERBURY, CONN.



# COMPLETE *Finishing* SYSTEMS

... for ENAMELS • LACQUER • PAINT • VARNISH



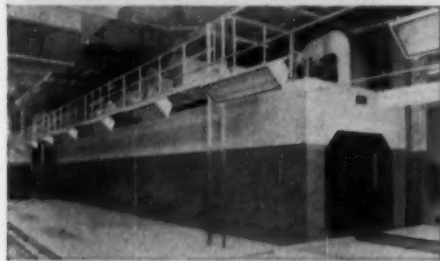
Mahon Pressurized Tack-Off Enclosure. These are installed at the entrance end of Mahon Sealer Coat and Finish Coat Spray Booths.



Sealer Coat Tack-Off Enclosure and Spray Booth. Similar Final Color Coat Equipment at Right, with Wet Sand Deck between.



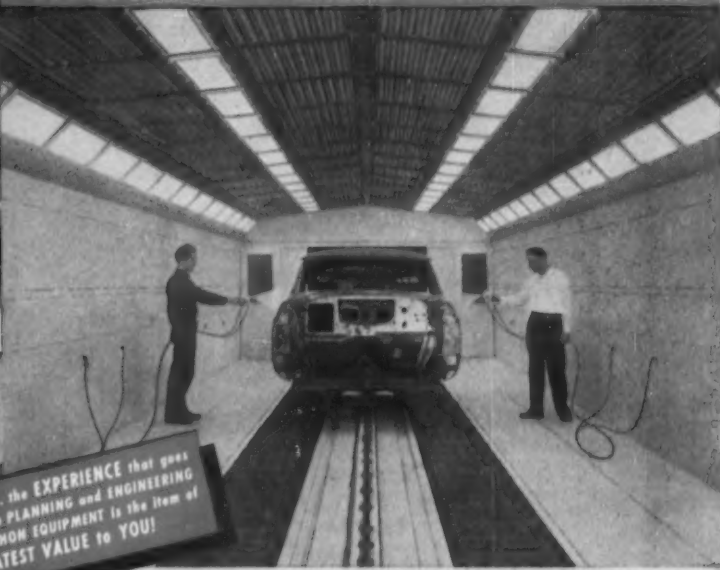
Mahon Automobile Body Finish Baking Ovens. These Ovens have multiple heat zones with automatic control for each zone.



Mahon Automobile Body Dry-Off Oven—employed after Cleaning and Rust Proofing and after Wet Sanding operations.



Mahon Cooling Tunnel. These Cooling Tunnels reduce time-length requirements—permit more compact arrangement of equipment.



Mahon Dry Sump, Down-Draft Hydro-Filter Spray Booth at Chrysler, Canada. These Booths are equipped with Paint Strippers for continuous cleaning of traveling grating in floor exhaust vents.

## CANADIAN CHRYSLER BODIES are FINISHED in NEW, MODERN MAHON FINISHING SYSTEM!

Chrysler Corporation of Canada, Ltd., can today point to one of the world's most modern and most efficient automobile body finishing systems. In planning this installation, no detail was overlooked by Chrysler and Mahon engineers that would in any way add to operating efficiency or minimize maintenance and operating costs . . . many new features which make for long-range economy and contribute to better working conditions make their appearance for the first time in equipment of this type. If you have a finishing problem, or are considering new finishing equipment, you, like thousands of other manufacturers, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning and engineering of equipment—which is the key to fine finishes at minimum cost. You will find also, that Mahon equipment is built better for more economical operation over a longer period of time—a factor to be weighed carefully when comparing initial cost figures. Mahon will do your complete job on one contract . . . undivided responsibility for the entire system insures proper coordination and safeguards you against complications which may upset your production plans or subsequent schedules. See Mahon's Insert in Sweet's Plant Engineering File for information, or write for Catalog A-655.

### THE R. C. MAHON COMPANY

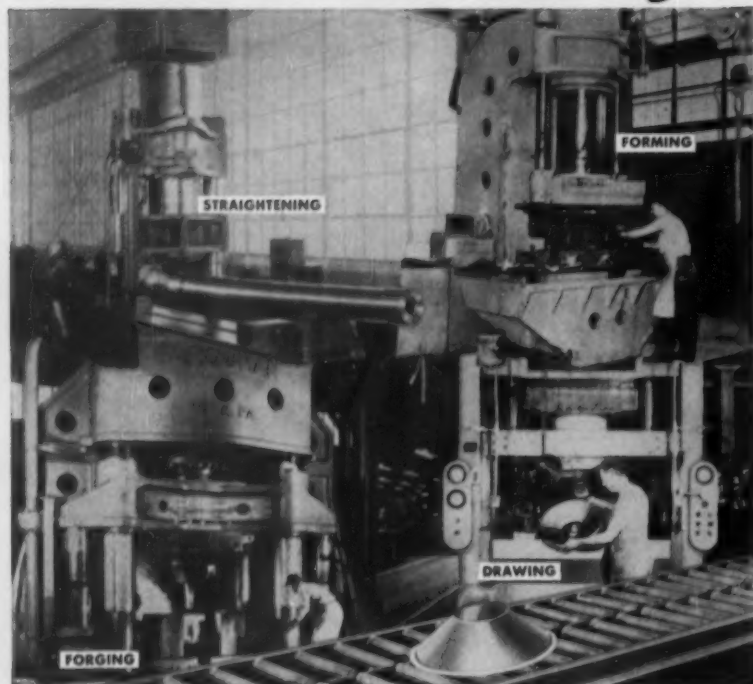
HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.  
Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems and Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

# MAHON

# Farquhar

## HYDRAULIC PRESSES

*Eliminate Metal Cutting*



Write for a copy of *Farquhar's* fact-packed Bulletin HP-49

### CHIP MAKING IS COSTLY

Metal formed to size and shape eliminates long costly machining operations. These are typical examples of the broad range of *Farquhar* presses that form metal to shape and eliminate costly metal-cutting. They're fast, sturdy, and efficient . . . a wise investment for cost-conscious manufacturers.

*Farquhar's* engineers will be glad to work with you on your metal-forming problems.

WRITE TODAY →

for a copy of Bulletin HP-49 covering a broad range of *Farquhar* Hydraulic Presses.



**A. B. FARQUHAR DIVISION**

THE OLIVER CORPORATION, 1503 Duke St., York, Pa.

### Riveting:

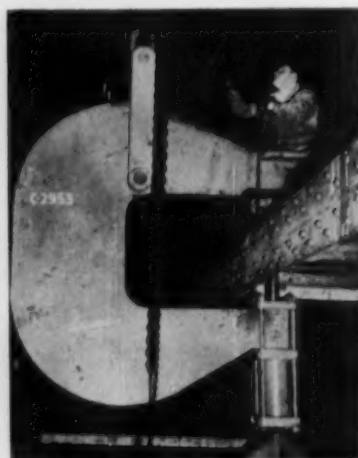
**Special riveters with 70-ton thrust speed bridge building.**

Hydraulic riveters used in high-way bridge construction by the New York Shipbuilding Corp. are driving as many as 360 rivets per hour. The riveters, specially designed by Manco Mfg. Co., Bradley, Ill., have a thrust of 70 tons.

Full stroke reciprocation takes about 31 seconds. The "C" shaped riveting head, which weighs 9300 lb, is powered from a 5-hp motor. The diameter of the double-acting cylinder is 6 in.

#### Upper Rivet Set Hinged

The anvil set is adjustable, by 1-in. increments, from 11½ in. to 13½ in. The upper rivet set is hinged so that the riveter can clear stiffening members when it is



**Hydraulic riveter . . .**



**Puts squeeze on rivets . . .**

## TECHNICAL BRIEFS

swung to another position by a gantry crane.

Since the ram can be stopped at any position on the return, the power stroke necessary to set a rivet can be held to a minimum. The time required to rivet a 1-in. diam rivet is only about 4 seconds.

## Tooling:

**Develop new epoxy resin compounds for casting, potting.**

Two new epoxy resin compounds have been developed for making pattern duplicates, fixtures and jigs for machining operations, and dies for forming, drawing and trimming. Though strongly fortified with aluminum, these compounds, made by Smooth-On Mfg. Co., Jersey City, mix easily with their curing agents and flow readily into complicated molds and patterns for good reproduction.

### Hard, Tough Solid

Curing is by chemical action, which holds shrinkage to less than 0.3 pct and eliminates cracking. Various commercial parting agents facilitate release. One compound, Metalset A306, cures to a hard, tough solid at room temperature in 2 to 24 hours, depending on size and shape. It is an effective potting compound. Because of its adhesiveness to metal, glass, or wood, it makes an excellent seal. It flows by gravity, or can be caulked. Heat curing makes the material hard.



Easily molded to shape . . .



## BURT VENTILATORS SOLVE LOCATION AND PRODUCTION PROBLEMS FOR OIC VALVES

The Ohio Injector Company, Wadsworth, Ohio—one of the nation's largest manufacturers of industrial valves—had two problems. Their plants are in a valley with almost no natural air movement. Their busy foundries create high heat, fumes and dust. Burt Ventilators solved both. Fifteen 30" Burt Free-Flow Ventilators on their Iron and Bronze Foundry and eleven 36" units on their Brass Foundry change the air every 3½ minutes. In other buildings, carefully spaced 60" Burt Free Exhaust Fan Ventilators provide fast, volume exhaust, changing the air every 4½ to 5 minutes. Workmen praise the system. Production has improved materially.

Burt's 53 years experience engineering and building ventilators is available to solve your problems—without obligation.



**Send for FREE Data Book!**

Write for Burt Data Book SPV-101-E. It supplies quick data on Burt's complete line of modern Roof Ventilators.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

**The Burt Manufacturing Company**

920 S. High St.

Akron 11, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION



**Cut  
STAINLESS  
STEEL  
buying  
costs!**

**SPECIFY  
MicroRold®  
SHEETS ROLLED  
TO THE LIGHT SIDE  
OF THE GAUGE RANGE**

Washington Steel's production methods provide new economies in the purchase of stainless sheet. The controlled accuracy of gauge in the rolling process gives you more area per ton or the equivalent area with lesser weight. This close adherence to specified gauge also results in longer die life.

**Washington Steel**  
CORPORATION  
WASHINGTON, PENNSYLVANIA

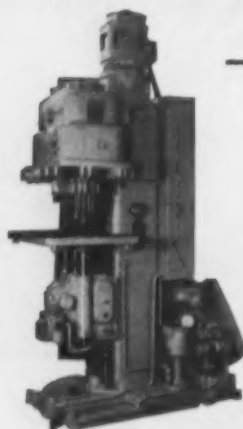


Your steel warehouse distributor will gladly tell you the MicroRold Story.

## Look to the Future

with

**RUTHMAN  
GUSHER  
COOLANT PUMPS**



*Illustrated is a  
ZH6-904 National  
Automatic Tool  
equipped with a  
Gusher Coolant  
Pump.*

Originators of the vertical ball-bearing machine tool motor driven coolant pump, Ruthman has maintained its reputation for excellence during the years by constant attention to quality, performance, and flexibility to customer requirements. In the future, as in the past, you can count on Ruthman to pioneer improvements and refinements that will make the Gusher an even better and more efficient pump for you.



**THE RUTHMAN MACHINERY CO.**

1809-1823 Reading Road

Cincinnati 2, Ohio

## Cutting:

**New oxygen machines  
cut fast contours.**

Greater speed and reduced costs for oxygen contour cutting are features claimed for the line of Ultra-Graph oxygen cutting machines made by Heath Engineering Co., Fort Collins, Colo.

The largest of the machines in regular production cuts a 72-in. straight line, a 38-in. circle and an 84-in. semi-circle. The smallest unit cuts a 60-in. straight line, a 29-in. circle and a 70-in. semi-circle. A machine now under construction will cut a 114-in. straight line, a 142-in. semi-circle and a 66-in. circle.

### High Cutting Speeds

Cutting speeds with certain models will reach 56 ipm for tracing purposes in special applications and welding.

These contour cutting machines do not use heavy electro-magnets on the tracing heads. Instead, the Ultra-Graph uses a light-weight Alnico permanent magnet which exerts a force of 3-12 lb against the template. Cost saving in the permanent magnet is in excess of \$300, and the fact that supporting arms can be made of light-weight, thin-walled tubing also contributes to overall savings.

Accuracy is insured by mounting the template follower in the same center-line as the cutting orifice in the torch head. Standard machine torches are used.



**Cuts odd shapes . . .**



## TECHNICAL BRIEFS

### Handling:

**Lift trucks provide dependable service.**

Reliable, trouble-free service is expected from modern materials handling equipment. From steel billets to finished forgings, all materials handling at the Kelly Works of True Temper Corp. depends on a skid-lift truck system which has been in virtually continuous operation since 1927.

The handling system at the Charleston, W. Va., plant is composed of seven electric-industrial platform-lift trucks of 4000 and 6000 lb capacity. There are also approximately 1000 steel skid bins in which the work is handled and stored. Some of the skid bins have drop-bottoms and are used principally for handling scrap.

Handling operations required for the making of axes are typical of those required for other True Temper products.

### Carry Hot Forgings

Axes are forged from cut-to-length steel billets. At the cutting operation, billets fall into skid bins at the shears. Loaded bins are carried by platform-lift truck to a battery of machines where the billets are (1) heated to forging temperature (2) forged into axe heads (3) trimmed and (4) pierced for handles.

After piercing, the still-hot heads drop into waiting skid containers ready to be trucked to the next operation. Scrap is carried away in drop-bottom bins and dumped by platform-lift truck.

Following this phase of production, the work is trucked to a scale for "weigh counting" and is then delivered to a normalizing furnace. Upon emerging from the furnaces the work is again accumulated in skid bins for delivery to the finishing department.

Besides being a flexible and dependable means of handling heavy, hot loads, the skid-lift-truck system allows temporary load storage with high space utilization. High-lift platform trucks tier skid-bin loads of this work up to four high.

# PUNCHES • DIES

## RIVET SETS • COMPRESSION RIVETER DIES



Made of highest standards and uniform quality thus insuring maximum service.

Since 1903

Large inventory of stock sizes of round punches and dies, also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. 8 for New Catalog 54

## GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL STREET

CHICAGO 8, ILLINOIS



"I'll bet he's dreaming about his production with Columbia EXTRA Carbon Tool Steel."

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.



## SITUATION UNDER CONTROL

BY KEOKUK

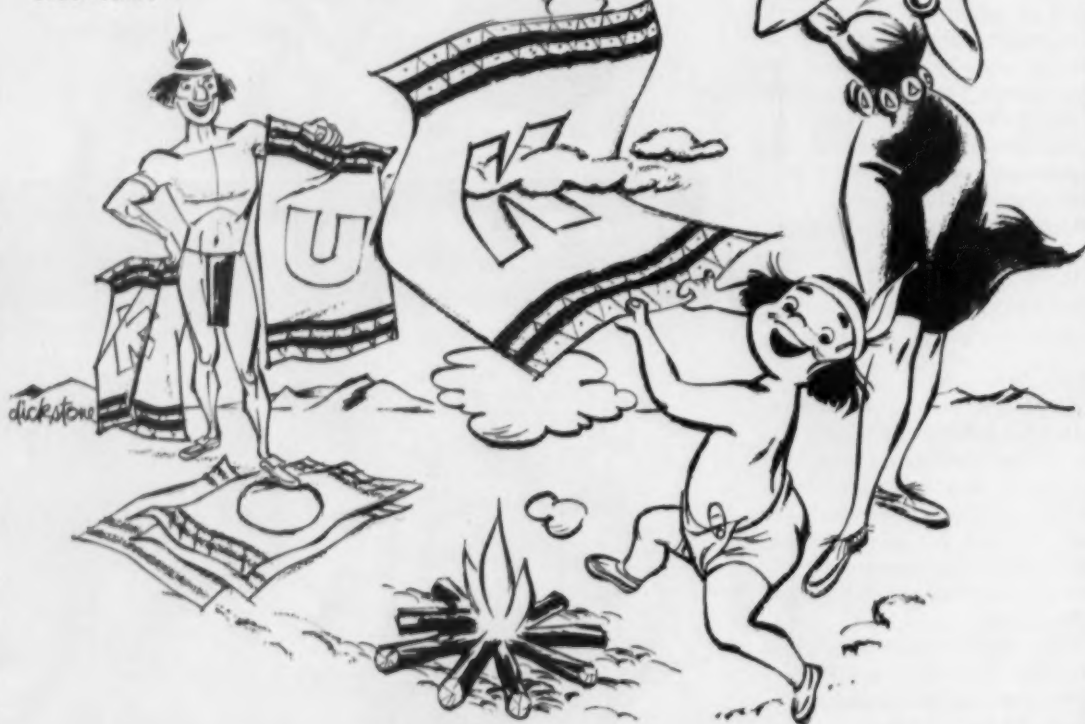


**CHIEF KEOKUK:**

"Little Chief say old way get smoke signals crossed. He cut letters in blankets!"

**PRINCESS WENATCHEE:**

"As usual he has the situation well under control!"



**KEOKUK**



**ELECTRO-METALS COMPANY**

KEOKUK, IOWA

WENATCHEE DIVISION, WENATCHEE, WASHINGTON

Smoke out high costs and control quality with Keokuk Silvery Pig Iron! Keokuk assures less waste and exact control of the melt through uniform silicon distribution. Car for car, pig for pig, its uniformity never varies. Charge Keokuk by magnet or count.

**SALES AGENT: MILLER AND COMPANY**

332 S. Michigan Ave., Chicago 4, Illinois  
3504 Carew Tower, Cincinnati 2, Ohio  
8230 Forsyth Blvd., St. Louis 24, Missouri

Keokuk Silvery . . . the superior form of silicon introduction for steel plants and foundries . . . available in 60 and 30 lb. pigs and 12½ lb. piglets . . . in regular or alloy analysis. Keokuk also manufactures high silicon metal.



## NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 117 or 118



### New feeding system increases efficiency 75 pct

Production rate of the Model A-190-R special thread rolling machine has been boosted to 230 to 250 pieces per min. The increase is due to a new feeding system which employs a rotary type hopper. This has a larger capacity and produces longer runs between refills. Power from a 1/12 hp motor drives the

hopper independently permitting variable bucket speeds by changing gears. Screw diameter capacity runs from No. 2 (0.086 in.) to No. 10 (0.190 in.). Thread length capacity is 1/8 to 1 1/2 in. with standard depth dies, and 2 in. with special dies. *Hartford Special Machinery Co.*

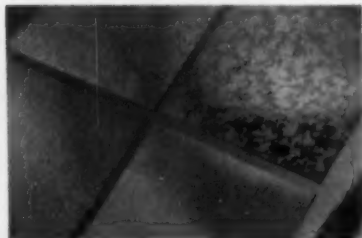
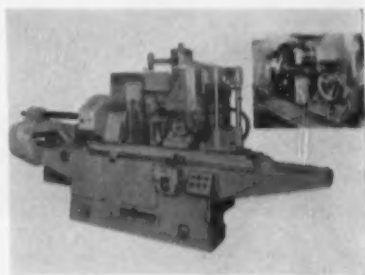
For more data circle No. 28 on postcard, p. 117.

### Grinds teeth on internal helical gear

The internal helical gear that can be ground on this modified Red Ring external gear tooth grinder has 8-pitch teeth and a helix angle of nearly 40°. The gear measures 18 in. diam x 1/2 in. thick. To grind the internal gear teeth the wheel spindle is swung to an angular setting corresponding to the helix

angle of the internal helical gear. Top surface of the wheel rather than the bottom contacts the work. When gear is positioned, the wheel is dressed and teeth are ground one space at a time and indexed to the next tooth space. *National Broach & Machine Co.*

For more data circle No. 29 on postcard, p. 117.



### Patterns rolled into cold rolled strip steel

Almost any design you can draw on a piece of paper is now rolled into cold rolled strip steel. The product comes in plain uncoated steel or electrolytically coated with copper, brass, nickel, chrome, zinc or lead alloy in natural, planished or buffed finishes. It can be hot dip coated

with lead alloy or tin, and lacquer coated either clear or colored. Pattern designed strip is produced in widths up to 18 in., and in a range of thicknesses from 0.010 to 0.125 in. *Thomas Strip Div., Pittsburgh Steel Co.*

For more data circle No. 30 on postcard, p. 117.

### Instrument for measurement of machine speeds

Measurement of very high machinery speeds is possible with a Celerimeter. The portable instrument is designed for measuring the straight-line speed of moving sections of fixed machinery and equipment. It is simple to operate and capable of measuring speeds ranging from 5 to 30,000 ipm. Use of the finest and fastest available electrical components is typified by the synchronous-motor indicator which

measures 0.01 second intervals. Example of its use is the determination of the proper shot plunger speed on a diecasting machine. After adjustments are once made to produce the best casting, the shot plunger can be regulated through use of the Celerimeter without spoilage of castings. *Lake Erie Engineering Corp.*

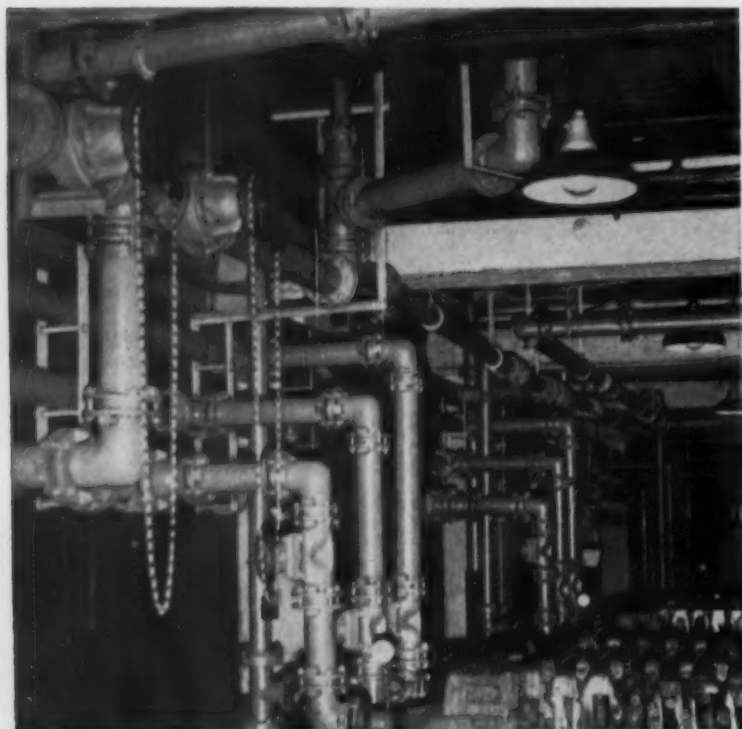
For more data circle No. 31 on postcard, p. 117.

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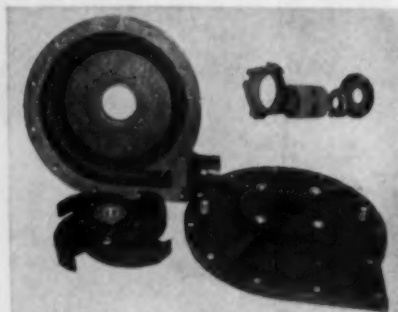


# WHERE **HAVEG** EQUIPMENT IS INSTALLED

PIPE • DUCT • FITTINGS • VALVES • PUMPS



A typical large installation of Haveg pipe, valves and fittings showing simple method of support required. Haveg pipe is unaffected by thermal shock, seldom requires insulation.



These Haveg parts are used in pumps for hot (104°F.) 30% Hydrochloric acid. Typical record: 33 months without replacing a single part. Many users report even longer life.



Escape potential valve troubles by buying Haveg y-valves and diaphragm valves which are smooth-molded, exactly machined, tested in the Haveg factory. Haveg works with you on special designs!

## Processing Corrosion has been Controlled!

Where liquids get hot and corrosive, it pays to consider all the facts about Haveg piping systems. Haveg has all the major ingredients for good chemical piping. Strength. Durability. Light weight. Outstanding resistance to corrosion and thermal shock.

It withstands rapid temperature changes and enables you to go into a high range of process temperatures with complete safety and a proven history of reliable performance. Haveg piping resists corrosion of practically all acids (except oxidizing acids) and lasts for years without repairs or maintenance.

Haveg piping is molded in diameters of 1/2" up and comes in lengths to 10'. It can be cut and fitted on the job (a new Haveg tool makes this even simpler—ask your Haveg engineer for details). For handling corrosive gases or fumes,

Haveg duct is made in cylindrical or rectangular shape with lighter walls. Fume hoods, bifurcators, fan housings, fittings, all are made from Haveg and give complete containment and control of corrosives.

It's a long story telling all about Haveg, the moldable, thermosetting plastic material made of acid-digested asbestos and synthetic resins. Haveg is both a material and a service . . . it comes from America's first molders of corrosion-resistant plastic equipment. It can be as big as a 200' stack, as small as a miniature pump part. Call the experienced sales engineer listed. Write for the 64-page illustrated Bulletin F-6 which contains size and chemical resistance charts, design specifications. Remember, Haveg is a logical, proven answer to your design problems in handling hot, corrosive liquids; in fact, in all equipment that must control processing corrosion.

ATLANTA, Exchange 3821 • CHICAGO 11, Delaware 7-6088  
CINCINNATI 36, Sycamore 2600 • CLEVELAND 20, Washington 1-8700  
DETROIT 39, Kenwood 1-1785 • HOUSTON 4, Jackson 6840  
LOS ANGELES 14, Mutual 1105 • SEATTLE 7, Hemlock 1351  
WESTFIELD, N. J., Westfield 2-7383

**HAVEG CORPORATION**  
NEWARK 7, DELAWARE  
FACTORY: WILMINGTON 8, DEL. • Wilmington 3-8884  
A SUBSIDIARY OF CONTINENTAL DIAMOND PAPER CO.

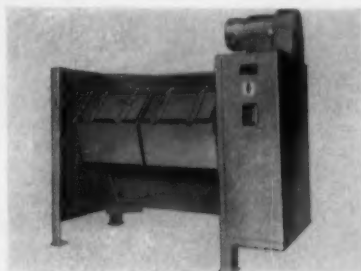


### Industrial vacuum cleaner has more cleaning power

Heavy-duty electric vacuum cleaner for industrial and automotive use has up to 20 pct more cleaning power, a dry capacity of  $1\frac{1}{2}$  bushels of dirt, and a wet recovery capacity of 13 gal. It will move 75 cu ft of air per min through a 1-in. orifice, and has a maximum sealed suction rating of 70 in. of water. Motor, rated at  $1\frac{1}{4}$  hp, is designed especially for vacuum cleaning. It is sealed against dirt and water, and has its own cooling fan. Super flexible, accordion-type hose measures 5 ft; may be

expanded to measure 15 ft. Swivel-type intake pipe may be rotated  $270^\circ$ , increasing the range of cleaning without moving the machine. Dust filter may be easily removed for cleaning, or it can be cleaned simply by shaking it, permitting the dirt to fall to the bottom of the tank. Various accessories are standard equipment; optional equipment for specific applications are available. *Black & Decker Mfg. Co.*

For more data circle No. 32 on postcard, p. 117.



### Tumbling machine provides larger finishing output

An 8-cu ft capacity features a new precision barrel finishing machine. An improved direct drive does not require chains or sprockets. The standard equipment includes a magnetic brake motor with jogging and reverse switch, a waterproof start-stop switch mounted on the front

panel for easy access, and a large cover completely housing the variable speed drive. The V-8 Model is available from stock in 1 to 4 barrel compartments, either unlined or lined with no-seam vinyl plastic lining. *Rampe Mfg. Co.*

For more data circle No. 33 on postcard, p. 117.

### Operating convenience stressed in new arc welders

A new line of ac transformer type arc welders, Model TLP-253-S with capacitors and TL-253-S without capacitors, are dual rated at 250 amp on 30 pct duty cycle, or 200 amp on 50 pct duty cycle for operation on single phase, 60-cycle, 230 v supply line. Welding current selection is made through a simple twist of a rubber hand wheel and rheostat knob. Both voltage and amperage are controlled to give the desired control of arc characteristics

for a variety of welding jobs. The transformer is the saturable leakage path type for maximum efficiency, ease of arc striking, and smooth welding. There are no moving parts. Core is welded and coils are firmly anchored for quiet operation. Absence of electrical connections between power lines and welding cables makes the welder extremely safe. Lifting eye provides easy handling. *Hobart Bros. Co.*

For more data circle No. 34 on postcard, p. 117.



### Hydraulic truck serves as a machine-of-all-work

The new 1-ton Morlift is a completely different unit with added built-in features and engineered for general utility within a plant. The Morlift weighs 2000-lb allowing it to travel with full load and rider in most elevators without exceeding safety specifications, and movement on upper floors that would not support old heavy type units. Travel speed is 1 to 3 mph with two speeds forward and two reverse. Short turning radius on a  $180^\circ$  axis permits operation in a 6-ft aisle and easy maneuverability

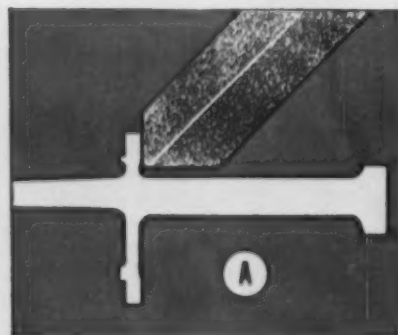
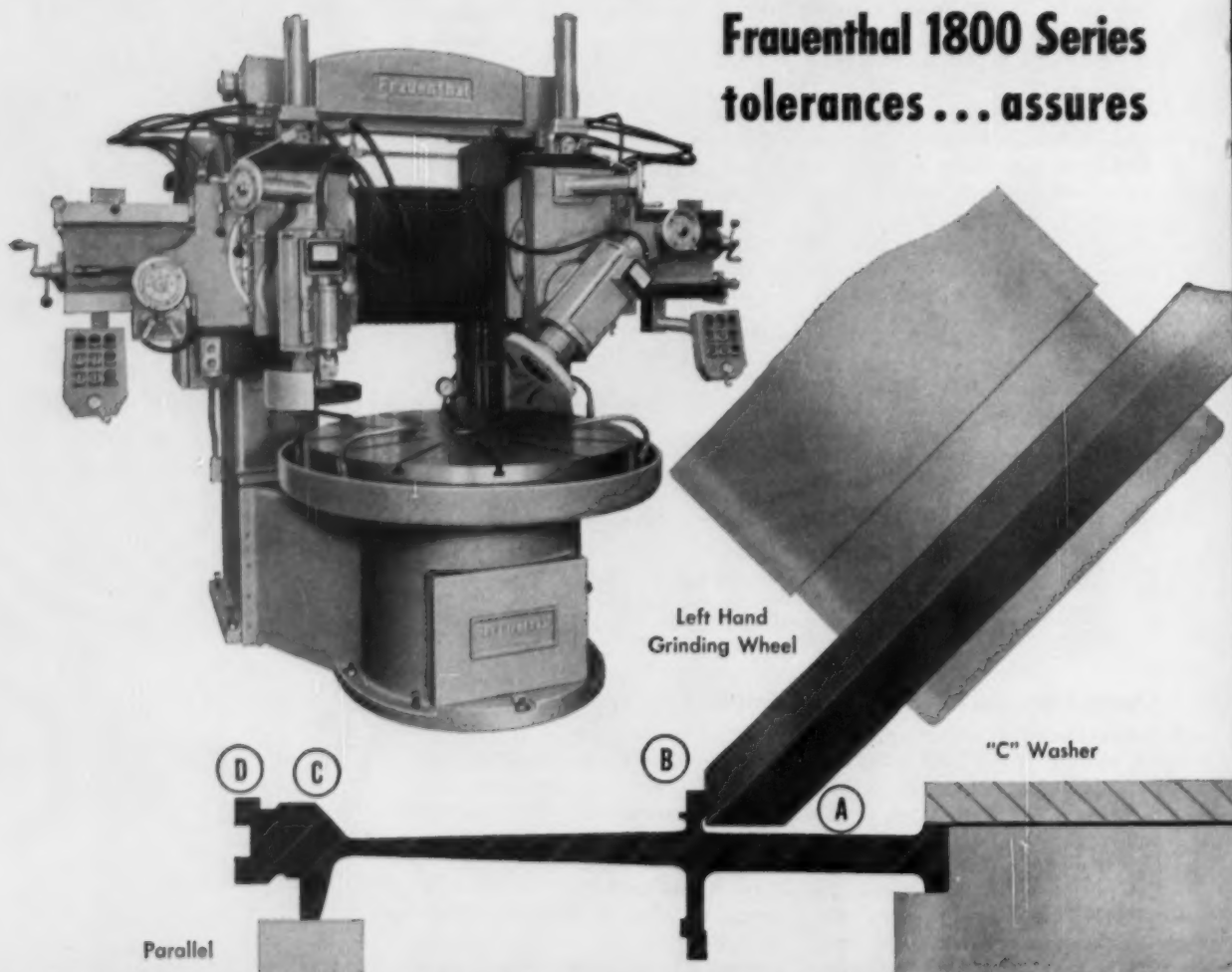
inside trailers, trucks, boxcars and other confined areas. The driver rides comfortably on a protected platform with operational controls at his left hand and a steering wheel conveniently at the right hand. Behind him, the rider is protected by a solid steel wrap-around in compliance with ASME safety codes. All controls operate through magnetic contactors. All parts are readily accessible behind hinged door panels. *John Morrell Mfg. Co.*

For more data circle No. 35 on postcard, p. 117.

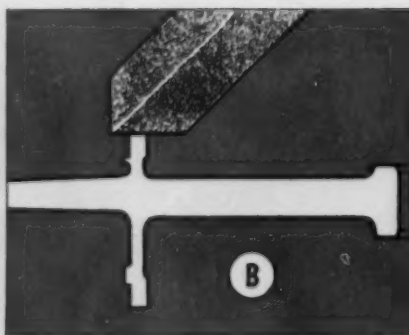
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# Multiple Grinding Operations

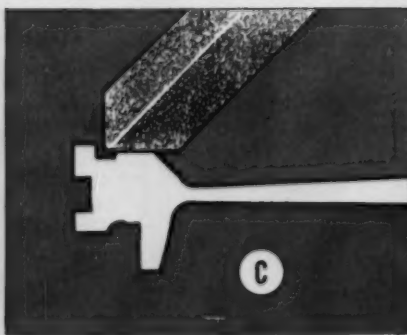
**Frauenthal 1800 Series  
tolerances . . . assures**



Jet engine part is set up on steel parallels and securely clamped to center pilot with large "C" washer.



Rigid mounting and proper alignment assures a high degree of accuracy in parallelism and roundness. Left hand



grinding wheel grinds one diameter and three related surfaces to extremely close tolerances.

## Frauenthal Division

# in One Set-Up

**Double Head machine finish grinds 6 surfaces to close concentricity of related surfaces...reduces grinding costs**

As illustrated in the schematic diagrams, three different diameters and three related surfaces of a jet engine component are precision-ground square and concentric with one another in a single setup using two grinding heads. This is a typical example of how a Frauenthal 1800 Series Double Head Grinder cuts grinding costs.

Frauenthal 1800 Series Grinders are available with four standard table sizes — 36", 42", 48" and 52" dia. with 60" maximum swing. Specially engineered operating features or job accessories can be included to fit your requirements.

With Frauenthal Grinders (1800 Series or 2200 Series) you're able to grind a number of related surfaces (up to 140" dia.) without changing setup of workpiece, and obtain accuracies within .000200". This assures you consistently uniform precision in concentricity, parallelism and roundness.

For complete details, contact Frauenthal of Muskegon.

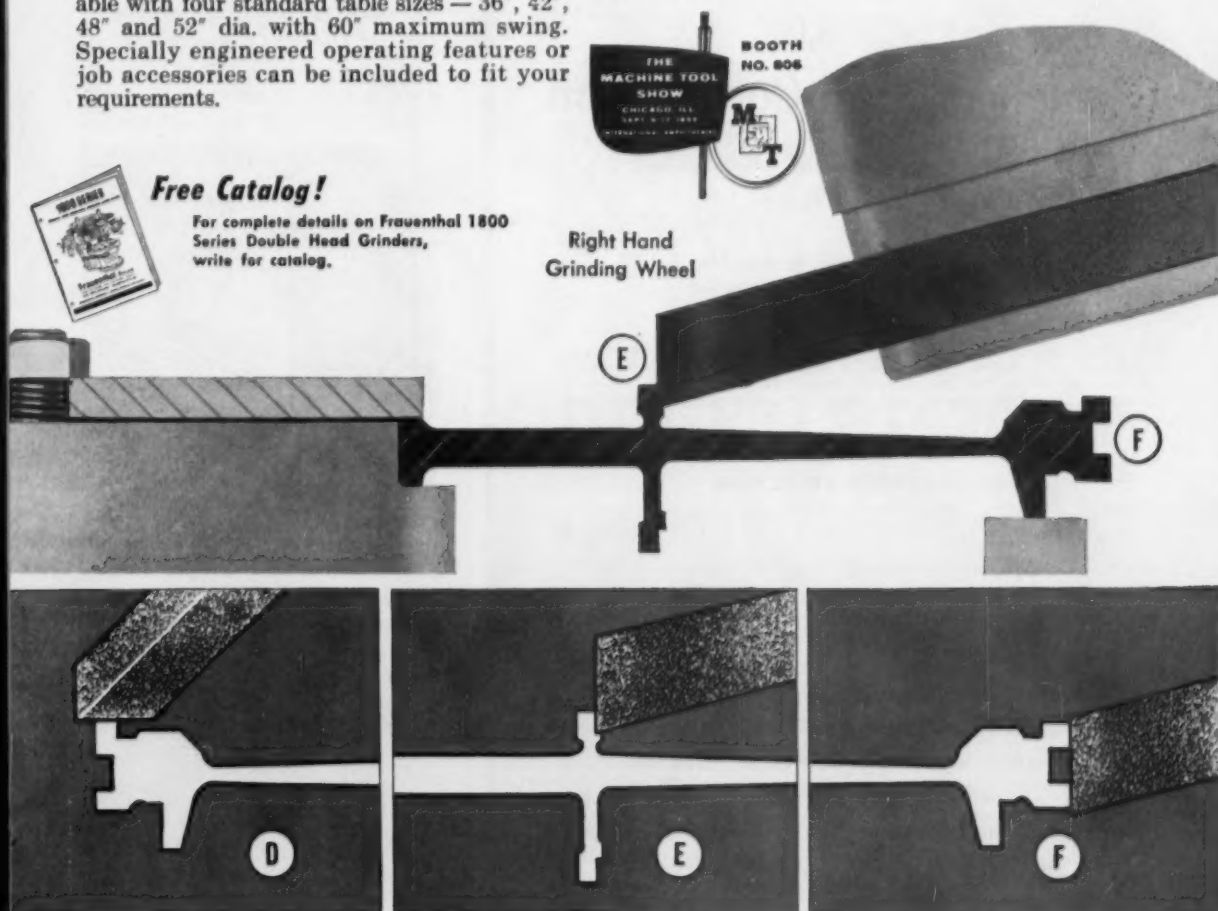


## Free Catalog!

For complete details on Frauenthal 1800 Series Double Head Grinders, write for catalog.



Right Hand Grinding Wheel



Starting from center of workpiece it finish grinds INNER diameter "A", and TOP FACES "B", "C" and

"D". Right hand grinding wheel finishes OUTER diameters "E" and "F". Both spindles are swiveled for acces-

sibility to the workpiece surfaces. All surfaces of jet engine part are ground within .000200".

**THE KAYDON ENGINEERING CORP.**  
MUSKEGON, MICHIGAN



### Sheet metal ball joints made in eight pipe sizes

Prefabricated sheet metal flexible ball joints are only 25 pct the weight of conventional cast iron ball joints. Pre-assembled, the flexible ball joints are of heavy sheet metal three-piece construction. They are sturdy, durable and easily positioned. No heavy supports are necessary. Corrosion resistant, they are electro-zinc plated on all surfaces before assembly. Eight pipe sizes

range from 3 to 12 in. diam. The 7 and 9-in. sizes provide a total arc of 45°; all other sizes permit 55° total deflection. The flexible ball joints can be used in such varied installations as exhaust systems, for dust and noxious fumes; in blower systems, for air conditioning and ventilating. Special sizes, heavier gages can be had. *Spincraft, Inc.*

For more data circle No. 36 on postcard, p. 117.

*This advertisement is not an offer to sell or a solicitation of an offer to buy these securities.  
The offering is made only by the Prospectus.*

#### NEW ISSUE

**\$191,659,000**

## Bethlehem Steel Corporation

**3¼% Twenty-five-Year Debentures**

**Due May 1, 1980**

**Convertible into Common Stock through May 1, 1965,  
unless called for previous redemption**

These Debentures are being offered by the Corporation to holders of its Common Stock for subscription, subject to the terms and conditions set forth in the Prospectus. The subscription offer will expire at 3:10 P.M., Eastern Daylight Saving Time, on May 23, 1965. The several underwriters may offer Debentures pursuant to the terms and conditions set forth in the Prospectus.

**SUBSCRIPTION PRICE 100%**

Copies of the Prospectus may be obtained in any State only from such of the several underwriters named in the Prospectus and others as may lawfully offer these securities in such State.

Kuhn, Loeb & Co.		Smith, Barney & Co.	
Dillon, Read & Co. Inc.	The First Boston Corporation	Harriman Ripley & Co.	
Blyth & Co., Inc.	Eastman, Dillon & Co.	Glore, Forgan & Co.	Goldman, Sachs & Co.
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Clark, Dodge & Co.	Dominick & Dominick	Drexel & Co.	Equitable Securities Corporation
Hallgarten & Co.	Hornblower & Weeks	W. E. Hutton & Co.	Ladenburg, Thalmann & Co.
W. C. Langley & Co.	Lee Higginson Corporation		Carl M. Loeb, Rhoades & Co.
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Shields & Company	Spencer Trask & Co.	Wertheim & Co.	Wood, Struthers & Co.

May 3, 1965

### Industrial diamond tools

New Permattach process of diamond mounting breaks with the traditional need of embedding three quarters of the diamond in holding material. Originally developed by General Electric Co., the process actually wets the surface of the diamond causing a permanent chemical union between the stone and the



tool shank. Maximum utilization of the stone is insured without resetting and pop off or dislodgement of diamonds is eliminated, according to the manufacturer. Permattach diamond tools are available in a complete line of wheel dressing, boring, thread grinding, radius and form dressers, shaped and lapped diamond tools. Diamond tools can be made to customer specifications. *Permattach Diamond Tool Co.*

For more data circle No. 37 on postcard, p. 117.

### Seals porous metals

Impregnating parts made of cast iron, alloys, aluminum, bronze, etc., to seal porosity against leakage of water, air, gas, and oil is possible with Kemi-Seal impregnator. The simple process of filling pores of these metals with Kemi-Seal can vary from a hand operation to a setup handling hundreds of thousands of parts per day. *Wayne Chemical Products Co.*

For more data circle No. 38 on postcard, p. 117.

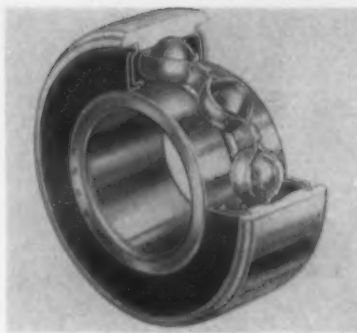


### Wide ball bearings equal to double row bearings

Wide type Mechani-Seal ball bearings are made in standard bores and outside diameters, with widths the same as those of corresponding size double row bearings. This W-KLL Series includes seven sizes and is designed for applications where frictionless sealing and large grease capacity are important. They are made of two dished steel plates. The inner member is

fixed securely in the outer ring of the bearing and provides effective grease retention. The corrosion-resistant outer member is pressed on the outside diameter of the inner ring and rotates as a slinger to throw off contaminants. Wide width provides extra support on shafts and housings. *Fafnir Bearing Co.*

For more data circle No. 39 on postcard, p. 117.



### Grease absorbent

An all-purpose grease absorbent for floors combines unusual traffic breakdown resistance with maximum protection against slipping accidents and fire hazards. The absorbent, known as Waverly Hi-Dri, can be used in any mill, plant, shop or factory that has to cope with oil or grease-soaked floors. It is harmless to handle and non-abrasive; is spread by hand or scoop, left there for a day or more until it reaches the saturation point. In the meantime, traffic may proceed over the layer as usual. Dirt and liquid absorbed by Hi-Dri are readily swept from the floor with a broom. *Waverly Petroleum Products Co.*

For more data circle No. 40 on postcard, p. 117.

### Small speed reducer

New small redesigned, horizontal DOX double reduction speed reducer with zinc alloy housing is available in ratios of 4:1 to 1600:1.



Torque capacities are 25 to 150 in-lb utilizing 1/6 hp. Standard DOX reducers are furnished with roller bearings. Bronze sleeve bearings are available, where applications permit. *Ohio Gear Co.*

For more data circle No. 41 on postcard, p. 117.

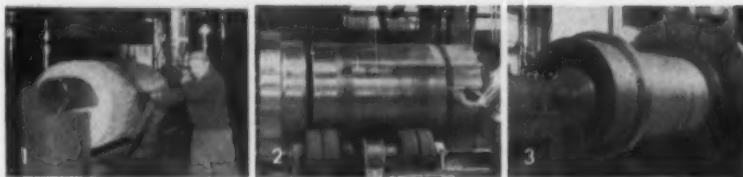
Turn Page

## Need Large Hydraulic Cylinders?



BUILT TO REQUIRED SIZES AND TOLERANCES BY

## TITUSVILLE FORGE



Hydraulic cylinders combining the advantages of thoroughly hot worked steel and clean automatic welding are being furnished by Titusville. Such cylinders insure the user of better physical characteristics (hollow forged shell and flanged sections together with upset forged top or dome sections), freedom from leakage under pressure because of porosity and the complete elimination of costly repairs or rejections. Fabrication is shown in photos above.

1. Hollow forging for shell section being hot worked on mandrel.
2. Hollow and upset forgings assembled for automatic welding.
3. Complete welded cylinder being rough turned in 80" engine lathe.

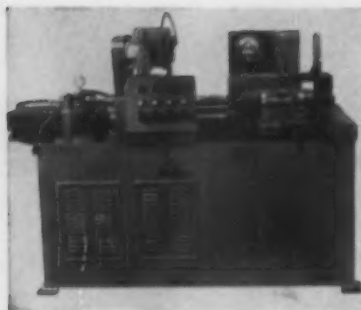
Let Titusville Forge build your hydraulic cylinders—to your most exacting requirements.



### STRUTHERS WELLS CORPORATION

TITUSVILLE FORGE DIVISION  
TITUSVILLE, PA.

PLANTS AT TITUSVILLE, PA., and WARREN, PA.  
Offices in Principal Cities



### Large honing machine requires only one operator

Model SA automatic honing machine features single spindle construction with a two-position fixture which can be loaded or unloaded while one piece is being honed. Automatic air gaging has been built into the honing mandrel which, after each honing cycle, moves into the bore and gages the part just honed. Movement of the honing head, fixture and air gages is hy-

draulically controlled. Constant pressure on the stone expansion is maintained by air. Pushbutton central control panel with signal lights governs the entire operation other than loading and unloading. Built-in electric timer allows variable cycling. Each machine is built to customer's specifications. *Superior Hone Corp.*

For more data circle No. 42 on postcard, p. 117.

### Testing of metals made easy

#### ...with fine accuracy assured

To test-best with mechanical ease, yet assured accuracy, for any given physical property—it is important you have *exactly the right machine*. For more than 40 years Steel City has designed and built the correct machines for various types of work, with the customers' requirements utmost in mind.

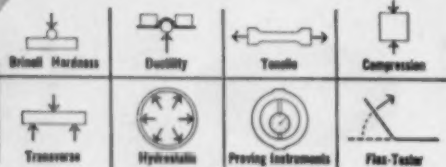
Illustrated Model UK-300-M is the *right* machine for testing Brinell Hardness where application requires limited production rate and fine accuracy. Machine is motorized, floor mounted and has wide range of application. Minimum maintenance needed.

Steel City has qualified sales representatives in major metal-working areas for your convenience. Write today for name of nearest representative . . . and detail information on complete line.

Manufacturers of machines for testing physical properties of metals, including:

**Steel City**  
**Testing Machines Inc.**

8815 Lyndon Ave. Detroit 38, Mich.



... and Special Testing Machines.

### Composition applicator

All types of bar compounds and rouge can be applied automatically to buffing wheels with a new completely enclosed composition applicator. Model No. 60, shown, is readily adaptable to automatic,



semi-automatic equipment, and hand jacks. It holds any length compound bar and will feed 10 in. of compound in one setting. *Packer Machine Co.*

For more data circle No. 43 on postcard, p. 117.

### Coats without etching

With new Galvinox products new or old galvanized metal surfaces can now be coated without etching treatment. New galvanized gutters, ducts, roofs, buildings can be protected right from the start and in the desired finished color—red, gray, metallic, or green—without etching. Only grease or oil need be removed before coating. On partially rusted surfaces, rust spots should be scraped and wire-brushed. Galvinox products may be applied by brush or spray. *Rust-Oleum Corp.*

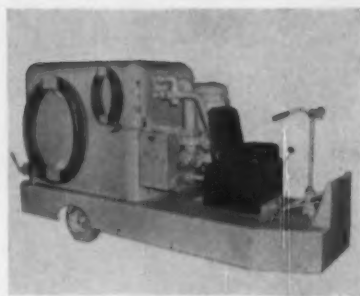
For more data circle No. 44 on postcard, p. 117.

### Scavenging unit collects 200 gal loads

For big-plant cleaning of machine sumps and drainage pits, a mobile scavenging unit, the Sludge-King, collects, hauls and discharges waste oil, water and sludge containing metal chips and grindings, regardless of viscosity. The unit develops a vacuum of 28 in. of mercury and performs even the most difficult cleaning jobs in only minutes. Un-

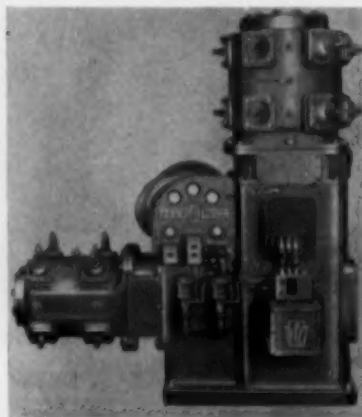
loading is quick. A shift of the valve lever converts the vacuum generator to a pressure-pump developing 20 psi, pressurizing the collection chamber and forcing contents out through the collection hose, at heights above 30 ft if desired. *Laidlaw Co.*

For more data circle No. 45 on postcard, p. 117.



### Duplex compressor

A duplex compressor designated Class HAE, is a two-stage, heavy-duty, water-cooled angle type machine. Capacity range is 797 and 974 cfm piston displacement; 125 and 150 hp. Outstanding features:



compact, portable, streamlined; flexibility of installation by virtue of reversible intake and discharge opening located on distance-pieces; easy to work upon, intercooler tubes replaceable; air-cushion valves; full pressure lubrication to all internal bearing surfaces. *Pennsylvania Pump & Compressor Co.*

For more data circle No. 46 on postcard, p. 117.

### Steel-cutting carbide

K21, the new Kennametal general purpose steel-cutting carbide, offers superior wear qualities, exceptionally high edge strength, and high resistance to thermal shock. It simplifies the problem of grade selection since it performs in all three groups — general steel-cutting, heavy roughing, and finishing. K21 is designed for cutting stainless steels, nickel steels, heat-resistant alloys, and high tensile alloy steels. *Kennametal, Inc.*

For more data circle No. 47 on postcard, p. 117.

FOUND WHERE WORLD FAMOUS AIRCRAFT ARE "BORN"

## GRAND RAPIDS GRINDERS



**Grand Rapids No. 55 Hydraulic Feed Surface Grinder**

This precision tool room type machine. Table speed up to 125 fpm. Working surface of table is 12" x 36". Vertical movement of wheel head 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1925 and 2500 rpm.



Just a note on your letter-head will bring you full details.

Just take a look in their toolrooms! Every one of these famous aircraft manufacturers uses Grand Rapids Grinders . . . engineered and built for unusual long life of precision grinding. Our Model 55 shown here, for instance, features column and base of massive, one-piece casting for vibrationless rigidity and permanent alignment. Both longitudinal table travel and cross feed are hydraulically actuated. Wheel head has powered rapid vertical travel. Table speed is variable up to 125 fpm . . . faster than any other of this type and size.

That's why so many tool room men insist on Grand Rapids Grinders.



**GALLMEYER & LIVINGSTON COMPANY** 400 Straight Ave., S.W., Grand Rapids, Mich.





## **"I need 6000 lbs. of structurals this afternoon--how about it?"**

(A true story) It was 4:10 in the afternoon when the purchasing agent of a construction company called his desk man at Ryerson. "I need some structural channels in a hurry—12 inch, 25 pound . . . let's see, 12 pieces—that's 6000 lbs. Can I have it today? I'm really in a jam."

Ryerson's large stocks of ASTM-Spec A-7 structurals included just what was wanted. The steel was immediately cut and loaded, and at 4:35—just 25 minutes after the call—our truck rolled into the construction company's yard. They were then able to fabricate the

channels in their own shop and have them in place by 11 P. M.

"I thought of Ryerson because I've always had good service from you," the customer commented later. "I know I was asking a lot, but you really came through for me!"

Whether it's your day-to-day requirements, or help in an emergency—count on Ryerson. Here are the world's largest steel stocks—un-surpassed facilities—and an organization eager and able to deliver. When you need steel—of whatever kind . . . call Ryerson.

## **RYERSON STEEL**

*Principal products in stock: bars, structurals, plates, sheets, tubing, alloy and stainless steel, re-bars, etc., also machinery and tools.*

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND  
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



# The Iron Age SUMMARY...

**A record first half is in sight . . . Present steel production pace can set all time high . . . Automotive pressure continues.**

**Record Half . . .** Steel production is well on its way to a record first half. And if the present pace continues, all previous predictions for the year will be knocked into a cocked hat.

It's conceivable that 1955 production will exceed the 1953 record of 111.6 million tons, barring an unexpected fourth quarter letdown or labor trouble in automotive or steel. Chances are that both industries will settle their negotiations peaceably.

**Backlogs Grow . . .** Despite record production last week and an even hotter pace this week, the mills still find their backlogs growing. Incoming orders continue to exceed industry capacity. And there's still the question of lagging deliveries. It will take a full month's production of some products to catch up with delivery promises.

Steel producers are amazed at the depth and strength of demand. As a result, they are (1) raising their sights on expansion plans, and (2) pushing for earlier completion. A new round of expansion and modernization rivaling the immediate post-war buildup is under way.

**Automotive Provides Bulge . . .** Still leading the pace is automotive. This industry currently is

taking 25 pct of all steel shipments and clamoring for more. Normally, the auto industry consumes an average of 20 pct of steel production. Furthermore, there is no letup in sight. The auto companies are delaying introduction of new models since current models are selling as fast as they come off the production lines.

**Railroads Move In . . .** At any rate, other consumers are not counting on relief in the pressure from Detroit and industry generally. Some have placed tentative orders for delivery of sheets in fourth quarter, just to be on the safe side.

Meanwhile, another industry — railroads — is adding its bit to the demand picture. The rails are a late starter and are applying pressure for earlier-than-scheduled deliveries.

With it all, there is little if any inventory building. Consumers are getting just enough steel to meet current requirements. A few report they are losing ground.

**Scrap Slump Continues . . .** Steel production this week is scheduled at 96.7 pct of capacity, which would smash the all-time record of 2,331,000 tons set last week.

Despite high steel output, THE IRON AGE steel scrap composite dropped to \$34.67.

## Steel Output, Operating Rates

Production	This Week†	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,334	2,331	2,304	2,280
<b>Ingot Index</b> (1947—49=100)	145.3	144.9	143.3	141.8
<b>Operating Rates</b>				
Chicago	99.5	99.0	98.5	99.0
Pittsburgh	100.0	100.0*	98.0	95.0
Philadelphia	98.0	95.0	96.0	94.5
Valley	99.0	97.0*	96.0	94.0
West	99.0	99.5*	89.3	95.0
Detroit	94.0	91.0*	93.0	90.0
Buffalo	105.0	105.0	105.0	100.0
Cleveland	104.9	103.5*	99.3	97.5
Birmingham	93.5	93.5	90.0	67.5
S. Ohio River	90.9	90.5*	90.4	87.0
Wheeling	98.0	101.0*	94.0	95.0
St. Louis	106.1	106.1	90.0	80.0
Northeast	103.6	99.4	80.0	94.0
<b>Aggregate</b>	96.7	96.5	95.5	94.0

\*Revised. †Tentative

## Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
<b>Composite price</b>				
Finished Steel, base	4.797	4.797	4.797	4.634
Pig Iron (Gross ton)	\$56.59	\$56.59	\$56.59	\$56.59
Scrap, No. 1 hvy (gross ton)	\$34.67	\$35.00	\$37.35	\$27.58
<b>Nonferrous</b>				
Aluminum, ingot	23.20	23.20	23.20	21.50
Copper, electrolytic	36.00	36.00	36.00	30.00
Lead, St. Louis	14.80	14.80	14.80	13.80
Magnesium, ingot	29.25	29.25	29.25	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	91.125	91.125	91.125	93.00
Zinc, E. St. Louis	12.00	12.00	12.00	10.25

## Galvanized Posing Problems

**Long range consumer demand is putting the squeeze on galvanized sheet output . . . Producers look for tighter days ahead . . . Most products in tight supply.**

♦ **HARD-PRESSED** producers of galvanized sheets foresee even harder times ahead. Consumers report that tonnages of this urgently-needed product, long in strong demand, are becoming scarcer than the proverbial hen's teeth.

In important producing centers, galvanized is virtually sold out for balance of the year. This situation likely will continue until new galvanized sheet capacity is brought into production.

Unofficial estimates are that galvanized sheet shipments this year will total 2½ million tons. Projections for 1960 are in the neighborhood of 3 million tons. These figures compare with over 1¼ million tons in 1940 and 1¾ million tons in 1949.

In 1949 there were eight galvanizing lines in operation and two lines under construction. In 1951 there were 10 lines operating and six under construction. Early this year there were 21 lines in operation, seven under construction, and construction of another six lines was being studied.

Compared with 1938 when galvanized sheet capacity was 2 million tons, the industry can now produce 3½ million tons annually, and new capacity is growing fast.

Demand for other products is stronger, if anything. Sheets and strip, bars, plates, structurals, pipe and tubing, tin plate, and wire products continue in tight supply.

A producer of stainless indicates that while his deliveries can be considered good at the moment he doubts whether he can maintain delivery promises if demand continues at its present pace. And there is no reason to believe that there will be a letdown.

**SHEETS AND STRIPS** . . . Deliveries are now running up to six weeks behind on cold-rolled sheets in Cleveland and producers are carefully screening 3rd and 4th quarter orders to eliminate any possible duplication and speculation. Chicago reports solid 3rd quarter bookings on an equal quota basis with some August delivery still quoted. Limited 4th quarter ordering by consumers who believe automotive demand will be solid even in model changeover period is reported. Detroit spotlight is focusing on galvanized sheet which is becoming tighter and may get worse. Late delivery schedules are posing headaches for Pittsburgh consumers, while in the East, one producer's galvanized is closed for August and he's now into Sept.

**BARS** . . . Chicago, Pittsburgh and the East report hot-rolled, carbon and alloy items are solid through 2nd quarter with firm 3rd quarter bookings now being targeted. In Detroit, lead time on bars is still nearly 60 days and deliveries are lagging anywhere from 3 to 5 weeks. Customer inventories in Chicago are reported low, in some cases posing as much of a problem as cold-rolled sheet. Shortage is putting increased pressure on warehouse stocks.

### Purchasing Agent's Checklist

**SCRAP:** What's behind lower prices in current market? . . . p. 58

**MARKETS:** Do-It-Yourself boosting metal-working, power tool profits . . . p. 67

**AUTOS:** Manufacturers say demand is outpacing supply . . . p. 72

**DEFENSE:** U.S. plans stepped up purchases in foreign markets p. 77

**MACHINE TOOLS:** Upcoming Chicago show will stress savings, obsolescence . . . p. 83

**PLATES** . . . Large plate consumers in Pittsburgh are having trouble maintaining production and are buying increasing amounts from warehouses. "Shop around" customers are helping to fill order entry bookings in the East through July and into August. In Chicago, delivery is into Sept. with plate fabricators at nearly capacity operation. Plate generally is a "boom" item. Detroit and West Coast report a tightening plate market.

**STRUCTURALS AND SHAPES** . . . A step-up in out-of-area buying is reported in Chicago with deliveries running into August. Wide-flange is strictly a quota item. In Pittsburgh, delivery backlogs are building up at a rapid pace well into 3rd quarter. Approved contracts for new roads, bridges and buildings are behind the impetus. In the East, wide-flange beams continue to lead the order parade with one producer's bookings now into July. West Coast building and highway programs are upping demand.

**PIPE AND TUBING** . . . In the East, a major producer is into 3rd quarter on seamless and oil country items. Increase in demand for specialty items is reported along with an upswing in inquiries on plastic tubing. Pittsburgh reports that demands for lap and butt-weld are stronger than at any time this year. Construction demand is placing increased orders for mechanical seamless.

**WIRE PRODUCTS** . . . Chicago reports merchants products very strong with mill stocks low and jobbers hot after larger supplies. Manufacturers wire is well into 3rd quarter for some producers. Delivery dates are now into late July and August. In Detroit, 3rd quarter wire and rod orders are coming in heavily. Most are automotive orders, but there is good demand for fencing, nails and barbed wire. In the East, pipe mesh, building and paving mesh are moving well into 3rd quarter on deliveries. A steady pickup in merchant wire demand is reported with delivery varying from 2 to 12 weeks, depending on size and type of item. Manufacturers wire is at 4-6 weeks.

**WAREHOUSE** . . . Cleveland warehouses report "normal business" on tonnage being shipped and order volume. Toughest items are flat-rolled, wide-flange beams and plates. Strong warehouse demand continues in Chicago, despite temporary slowdown in gray market reports. Warehouses are taking anything they can get their hands on.

# Comparison of Prices

(Effective May 10, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	May 10 1955	May 3 1955	Apr. 12 1955	May 11 1954
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	4.05¢	4.05¢	4.05¢	3.925¢
Cold-rolled sheets	4.95	4.95	4.95	4.775
Galvanized sheets (10 ga.)	5.45	5.45	5.45	5.275
Hot-rolled strip	4.05	4.05	4.05	3.925
Cold-rolled strip	5.79	5.79	5.79	5.513
Plate	4.225	4.225	4.225	4.10
Plates wrought iron	9.30	9.30	9.30	9.30
Stain's C-R strip (No. 302)	41.50	41.50	41.50	41.50

<b>Tin and Terplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	\$9.05	\$9.05	\$9.05	\$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. terms	7.85	7.85	7.85	7.75

<b>Bars and Shapes: (per pound)</b>				
Merchant bars	4.30¢	4.30¢	4.30¢	4.16¢
Cold-finished bars	5.40	5.40	5.40	5.20
Alloy bars	5.075	5.075	5.075	4.875
Structural shapes	4.25	4.25	4.25	4.10
Stainless bars (No. 302)	35.50	35.50	35.50	35.50
Wrought iron bars	10.40	10.40	10.40	10.40

<b>Wire: (per pound)</b>				
Bright wire	5.75¢	5.75¢	5.75¢	5.525¢

<b>Nails: (per 100 lb.)</b>				
Heavy nails	\$4.45	\$4.45	\$4.45	\$4.325
Light nails	5.35	5.35	5.35	5.20

<b>Semi-finished Steel: (per net ton)</b>				
Re-rolling billets	\$64.00	\$64.00	\$64.00	\$62.00
Slabs, re-rolling	64.00	64.00	64.00	62.00
Forging billets	78.00	78.00	78.00	75.50
Alloy blooms, billets, slabs	86.00	86.00	86.00	82.00

<b>Wire Rod and Skelp: (per pound)</b>				
Wire rods	4.675¢	4.675¢	4.675¢	4.525¢
Skelp	3.90	3.90	3.90	3.75

<b>Finished Steel Composite: (per pound)</b>				
Base price	4.797¢	4.797¢	4.797¢	4.684¢

**Finished Steel Composite**  
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**  
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	May 10 1955	May 3 1955	Apr. 12 1955	May 11 1954
<b>Pig Iron: (per gross ton)</b>				
Foundry, del'd Phila.	\$61.19	\$61.19	\$61.19	\$61.19
Foundry, Valley	56.50	56.50	56.50	56.50
Foundry, Southern, Cin'ti	60.48	60.48	60.48	60.48
Foundry, Birmingham	52.88	52.88	52.88	52.88
Foundry, Chicago	56.50	56.50	56.50	56.50
Basic, del'd Philadelphia	60.27	60.27	60.27	60.27
Basic, Valley furnace	56.00	56.00	56.00	56.00
Mallies, Valley	56.50	56.50	56.50	56.50
Ferromanganese, cents per lb.	9.50¢	9.50¢	9.50¢	10.00¢

\$74-76 pct Mn base.

<b>Pig Iron Composite: (per gross ton)</b>				
Pig iron	\$66.59	\$66.59	\$66.59	\$66.59

<b>Scrap: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$34.50	\$35.50	\$35.50	\$35.50
No. 1 steel, Phila. area	35.00	35.00	37.00	22.75
No. 1 steel, Chicago	33.50	33.50	36.50	29.50
No. 1 bundles, Detroit	27.00	27.00	29.00	23.50
Low phos., Youngstown	35.50	35.50	39.50	31.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	43.50	43.50
No. 1 mach'y cast, Philadel'a.	44.50	44.50	44.50	39.50
No. 1 mach'y cast, Chicago	46.50	46.50	48.00	41.00

<b>Steel Scrap Composite: (per gross ton)</b>				
No. 1 heavy melting scrap	\$34.67	\$35.00	\$37.33	\$27.58

<b>Coke, Connellsville: (per net ton at oven)</b>				
Furnace coke, prompt	\$13.00	\$13.00	\$13.00	\$14.38
Foundry coke, prompt	16.75	16.75	16.75	16.75

<b>Nonferrous Metals: (cents per pound to large buyers)</b>				
Copper, electrolytic, Conn.	36.00	36.00	36.00	36.00
Copper, Lake, Conn.	36.00	36.00	36.00	36.00
Tin, Straits, New York	91.125¢	91.125	91.125	93.00
Zinc, East St. Louis	12.00	12.00	12.00	10.25
Lead, St. Louis	14.80	14.80	14.80	14.80
Aluminum, virgin ingot	23.25	23.25	23.25	21.50
Nickel, electrolytic	67.67	67.67	67.67	63.00
Magnesium, ingot	28.25	28.25	28.25	27.75
Antimony, Laredo, Tex.	28.50	28.50	28.50	28.50

† Tentative. ‡ Average. \* Revised.

**Steel Scrap Composite**  
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 163→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem B3	58.00	58.50	59.00	59.50	
Birmingham R3	52.35	52.85			
Birmingham W9	52.35	52.85			
Birmingham U4	52.35	52.85			
Buffalo R3	56.00	56.50	57.00		
Buffalo I11	56.00	56.50	57.00		
Buffalo W6	56.00	56.50	57.00		
Chicago I4	56.00	56.50	56.50		
Cleveland A5	56.00	56.50	56.50	57.00	61.00
Cleveland R3	56.00	56.50	56.50		
Deeringfield L3	52.50	52.50	52.50		
Dubuque I4	56.00	56.50	56.50	57.00	
Erie I4	56.00	56.50	56.50	57.00	
Everett M6		61.00	61.50		
Fantana K1	62.00	62.50			
Ganora, Utah C7	56.00	56.50			
Granite City G2	57.90	58.40	58.90		
Hubbard V1			56.50		
Minneapolis C6	55.00	55.00	55.00		
Monessen P6	56.00	56.50	56.50		
Neville Isl. P4	56.00	56.50	56.50		
N. Tonawanda T1	56.00	56.50	57.00		
Pittsburgh U1	56.00	56.50	57.00	57.00	
Sharpsville S3	56.00	56.50	56.50	57.00	
So. Chicago R3	56.00	56.50	56.50		
Steelton B3	56.00	56.50	56.50	59.50	64.00
Sveasland A2	53.00	53.50	53.50	59.50	
Toldeo I4	56.00	56.50	56.50	57.00	
Troy, N. Y. R3	53.00	53.50	53.50	59.50	64.00
Youngstown Y1		56.50	57.00		

**DIFFERENTIALS:** Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional, 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content 0.70 and over.

**Silvery Iron:** Buffalo, H1, \$66.25; Jackson, J1, G1, \$65.00. Add \$1.00 per ton for each 0.50 pct silicon over base (0.51 to 0.50 pct) up to 17 pct. Add \$1 per ton for 9-15 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Reassess ferro-silicon prices are \$1 over comparable silvery iron.

## STAINLESS STEEL

Base price cents per lb., f.o.b. mill

Product	301	302	303	304	316	321	347 Ch	410	416	430
Ingot, re-rolling	16.75	17.75	19.25	19.00	23.75	23.50	35.50	14.00	—	14.25
Slabs, billets, re-rolling	21.00	23.25	25.25	24.50	38.00	30.25	66.75	18.25	—	18.5
Forg. discs, die blocks, rings	39.00	39.00	42.00	41.25	61.75	46.25	—	31.00	31.75	41.7
Billets, forging	30.00	30.25	32.75	31.75	46.25	36.00	54.75	24.00	24.50	24.5
Bars, wires, structurals	35.75	36.00	38.75	38.00	57.25	42.75	64.25	28.75	29.25	29.2
Plates	37.75	38.00	40.25	40.50	60.50	46.50	69.25	30.00	30.50	30.5
Sheets	41.75	42.00	49.25	44.50	64.50	51.25	77.50	34.25	41.25	34.7
Strip, hot-rolled	30.25	32.50	37.25	35.00	55.00	41.75	63.00	26.25	—	27.0
Strip, cold-rolled	38.75	42.00	46.00	44.50	64.50	51.25	77.50	34.25	41.25	34.75

### STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2, J2; Baltimore, Md.; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J4; Philadelphia, D5.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (25¢ per lb higher) W1 (25¢ per lb higher); New Bedford, Mass., R6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3; Ft. Wayne, J4; Philadelphia, D5.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, Pa.; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Cantonville, Pa., C15, Philadelphia, D5.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.



## Scrap Market Stays Shaky

**Pittsburgh price for No. 1 heavy melting drops another dollar . . . Electric furnace and blast furnace grades sink in Chicago . . . East shows weakness.**

◆ **AGAIN** this week the scrap story was one of falling prices and sluggish activity. Pittsburgh continued to lead the downward march, with the prices for steel-making grades dropping \$1. Blast furnace grades were holding in the Pittsburgh area; railroad scrap was down.

In Chicago, the mills turned to the No. 2 steelmaking grades and bought at a price that was off \$1 on the average. Cast and railroad grades continued to show strength but there was evidence that rails might be ready for a decline.

In the East, the price of No. 1 heavy melting held firm but blast furnace and electric furnace grades were off 50¢ to \$1. Dealers in the area were indignant at the suggestion scrap was being shipped for ultimate destinations within the Iron Curtain. It has been pointed out to Congress that scrap shipments call for documentation of ultimate user and that friendly countries are too badly in need of scrap themselves to pass any on.

**THE IRON AGE** Heavy Melting Steel Scrap Composite dropped 33¢ to \$34.67.

**Pittsburgh . . .** No. 1 heavy melting dropped another \$1 to \$35 as a large consumer purchased a substantial tonnage. No. 2 heavy melting and No. 2 bundles were also down a \$1 on the same purchase. Blast furnace grades were holding for the moment, but new sales are in the offing. Brokers are trying to hold prices at current levels against mill pressure for lower prices. Railroad scrap was down substantially as the latest lists reflected the general weakening of the market over the past several weeks. No. 1 RR heavy melting was off \$2.50 a ton and specialties were down \$1.50.

**Chicago . . .** The market continued to sink this week as mills moved into the No. 2 steelmaking grades to make fresh purchases at lower price, and as electric furnace and blast furnace grades continued to sink slightly. Cast continued to indicate strength as did rails, but railroad grades of scrap generally were sharing the market weakness. There were early indications of a coming slide in rails but this had not been confirmed in actual sales at press time. It was known, however, that some railroad offering prices were being turned down by buyers who were previously eager to lay in rail grades. Broker buying was light, even at reduced prices and it appears that sinking prices have done little to diminish the amount of scrap being offered for sale. No. 1 heavy melting continues to hold last week's level, but both turnings and No. 1 bundles are weak at present prices.

**Philadelphia . . .** No. 1 heavy melting price remains at \$36.50 tops with a drop of 50¢ reported in the price of No. 2 heavy melting. Some softening in blast furnace and low phos grades is reported, with most others holding firm in the face of a generally spotty buying market. Exports are back to normal following a brief shutdown of port facilities last week.

**New York . . .** Reports on the New York market varied from dull to steady. Price of No. 1 heavy melting held firm. Price action was confined to minor downward adjustments of blast furnace grades and No. 2 steel-making grades.

**Detroit . . .** No activity has been reported here since last week's drop of \$2. Dealers report they are having a hard time making sales but they are able to supply some small tonnages to the mills. Because the market is down, rejections have increased considerably. Predictions are that the market is going to get a little softer, particularly in the No. 2 grades.

**Cleveland . . .** Routine automotive foundry order for substantial tonnage of foundry steel, 2 ft and under, at \$39 delivered was only major activity in area last week. Foundry buy was \$2.50 under price a month ago and \$1.50 under 2 weeks ago. Secondary steel grades and bundles continue a glut on the market in Cleveland and the Youngstown districts. Brokers shipping heavy on most orders to get in maximum allowable tonnage but mills negotiating prices on all over-shipments.

**Birmingham . . .** On appraisal, the market is off anywhere from \$1 to \$2 per ton. This drop has not yet shown up but the district's largest steel scrap buyer has been out of the market for some time and brokers anticipate a reduction when it again buys. An Atlanta mill, which recently established a \$2 per ton springboard for remote scrap, dropped the springboard this week and reports it is getting sufficient scrap at the lower price. Previously established springboards on scrap also have dropped.

**St. Louis . . .** Steel mill operations continue at a high rate but receipts are either equal to or slightly more than the melt of scrap. Prices are unchanged and are expected to remain so at least until commitments are made for June shipment. Local areas have provided a steady supply of scrap without looking to distant points.

**Cincinnati . . .** Plenty of scrap is still moving on old orders but market on new orders is in doldrums. Heavy sheet production in area is keeping scrap consumption up but inventories still remain heavy. Brokers and dealers covering tonnage on recent sales with ease.

**Buffalo . . .** Scrap market in Buffalo is very quiet. Prices held firm except for low phos, punchings, plate, which dropped \$1 to \$33 to \$34.

**Boston . . .** Both export and domestic business continues to fall off. Activity is down. Further woes for scrap may come in the form of increased water shipping rates as heavy general traffic is tending to bid rates up.

**West Coast . . .** Prices firm in San Francisco Bay Area at higher levels reported last week (up \$3 per ton on most grades). San Francisco export activity fairly strong with four cargoes slated for the Orient within next 60 days.



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**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**

# Scrap Prices (Effective May 16, 1955)

## Pittsburgh

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	24.00 to 25.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	20.50 to 21.50
Mixed bor. and ma. turns.	20.50 to 21.50
Shoveling turnings	24.50 to 25.50
Cast iron borings	24.50 to 25.50
Low phos. punch'gs, plate	39.00 to 40.00
Heavy turnings	32.00 to 33.00
No. 1 RR. hvy. melting	36.50 to 37.50
Scrap rails, random lgth.	42.50 to 43.50
Rails 2 ft and under	47.50 to 48.50
RR. steel wheels	42.50 to 43.50
RR. spring steel	42.50 to 43.50
RR. couplers and knuckles	42.50 to 43.50
No. 1 machinery cast.	43.00 to 44.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	34.00 to 35.00

## Chicago

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 factory bundles	35.00 to 36.00
No. 1 dealers' bundles	32.00 to 33.00
No. 2 dealers' bundles	22.00 to 24.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Low phos. forge crops	39.00 to 40.00
Low phos. punch'gs, plate	37.00 to 38.00
Low phos. 1 ft and under	35.00 to 37.00
No. 1 RR. hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	52.00 to 53.00
Rails 2 ft and under	49.00 to 50.00
Locomotive tires, cut	36.00 to 37.00
Cut bolsters & side frames	38.00 to 39.00
Angles and splice bars	43.00 to 44.00
RR. steel car axles	42.00 to 43.00
RR. couplers and knuckles	40.00 to 41.00
No. 1 machinery cast.	46.00 to 47.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	33.00 to 34.00
Cast iron car wheels	37.00 to 38.00
Malleable	48.00 to 49.00
Stove plate	35.00 to 37.00

## Philadelphia Area

No. 1 hvy. melting	\$35.50 to \$36.50
No. 2 hvy. melting	31.50 to 32.50
No. 1 bundles	35.50 to 36.50
No. 2 bundles	26.00 to 27.00
Machine shop turn.	20.50 to 21.50
Mixed bor. short turn.	20.50 to 21.50
Cast iron borings	20.50 to 21.50
Shoveling turnings	23.00 to 24.00
Clean cast chem. borings	28.00 to 29.00
Low phos. 5 ft and under	39.00 to 40.00
Low phos. 2 ft and under	40.00 to 41.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	34.00 to 35.00
RR. steel wheels	41.00 to 42.00
RR. spring steel	41.00 to 42.00
Rails 18 in. and under	60.00 to 62.00
Cupola cast.	36.00 to 37.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	44.00 to 45.00
Malleable	44.00 to 45.00
Unstripped motor blocks	37.00 to 38.00
No. 1 machinery cast.	44.00 to 45.00
Charging box cast.	37.00 to 38.00

## Cleveland

No. 1 hvy. melting	\$31.50 to \$32.50
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles	31.50 to 32.50
No. 2 bundles	25.00 to 27.00
No. 1 busheling	31.50 to 32.50
Machine shop turn.	17.50 to 18.50
Mixed bor. and turn.	22.50 to 23.50
Shoveling turnings	23.50 to 24.50
Cast iron borings	22.50 to 23.50
Cut structural & plates, 2 ft & under	40.00 to 41.00
Drop forge flashings	31.50 to 32.50
Low phos. punch'gs, plate	33.50 to 34.50
Foundry steel, 2 ft & under	38.00 to 39.00
No. 1 RR. heavy melting	35.00 to 36.00
Rails 2 ft and under	48.00 to 49.00
Rails 18 in. and under	49.00 to 50.00
Railroad grate bars	36.00 to 37.00
Steel axle turnings	28.00 to 29.00
Railroad cast.	44.00 to 45.00
No. 1 machinery cast.	44.00 to 45.00
Stove plate	43.00 to 44.00
Malleable	44.00 to 45.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Youngstown

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	24.00 to 25.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	19.00 to 20.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. plate	35.00 to 36.00

## Buffalo

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	30.00 to 31.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	21.50 to 22.50
Cast iron borings	20.50 to 21.50
Low phos. plate	33.00 to 34.00
Scrap rails, random lgth.	35.00 to 36.00
Rails 2 ft and under	42.00 to 43.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
RR. couplers and knuckles	36.00 to 37.00
No. 1 machinery cast.	40.00 to 41.00
No. 1 cupola cast.	36.00 to 37.00

## Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$26.50 to \$27.50
No. 2 hvy. melting	21.00 to 22.00
No. 1 bundles, openhearth.	26.50 to 27.50
No. 2 bundles	18.00 to 19.00
New busheling	26.50 to 27.50
Drop forge flashings	26.50 to 27.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	14.50 to 15.50
Shoveling turnings	15.50 to 16.50
Cast iron borings	15.50 to 16.50
Low phos. punch'gs, plate	27.50 to 28.50
No. 1 cupola cast.	35.00 to 37.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	31.00 to 32.00
Automotive cast.	40.00 to 41.00

## St. Louis

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	24.50 to 25.50
Machine shop turn.	15.50 to 16.50
Cast iron borings	17.50 to 18.50
Shoveling turnings	17.50 to 18.50
Rails, random lengths	36.00 to 37.00
Rails, 18 in. and under	40.00 to 41.00
Locomotive, tires uncut	36.50 to 37.50
Angles and splice bars	36.50 to 37.50
Std. steel car axles	36.00 to 37.00
RR. spring steel	37.00 to 38.00
Cupola cast.	42.00 to 43.00
Hvy. breakable cast.	34.00 to 35.00
Cast iron brake shoes	32.00 to 33.00
Stove plate	25.00 to 26.00
Cast iron car wheels	36.00 to 37.00
Malleable	36.00 to 37.00
Unstripped motor blocks	33.50 to 34.50

## Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 bundles	26.00 to 27.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	26.00 to 27.00
Elec. furnace, 3 ft & under	31.00 to 32.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and short turn.	13.50 to 14.50
Shoveling turnings	14.50 to 15.50
Clean cast chem. borings	15.00 to 16.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	27.00 to 28.00
Unstripped motor blocks	17.00 to 18.00

## New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$31.50
No. 2 hvy. melting	27.00
No. 3 bundles	\$22.00 to 23.00
Machine shop turn.	10.50 to 11.50
Mixed bor. and turn.	11.50 to 12.50
Shoveling turnings	13.50 to 14.50
Clean cast chem. borings	20.00 to 21.00
No. 1 machinery cast.	37.00 to 39.00
Mixed yard cast.	31.00 to 32.00
Charging box cast.	31.00 to 32.00
Heavy breakable cast.	11.00 to 12.00
Unstripped motor blocks	23.00 to 23.00

## Birmingham

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	19.00 to 20.00
Electric furnace bundles	22.00 to 23.00
Bar crops and plate	36.00 to 37.00
Structural and plate, 2 ft.	36.00 to 37.00
No. 1 RR. hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	42.00 to 43.00
Rails, 18 in. and under	45.00 to 46.00
Angles & splice bars	43.00 to 44.00
Rerolling rails	43.00 to 44.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	32.00 to 33.00
Unstripped motor blocks	25.50 to 26.50
Mashed tin cans	15.00 to 16.00

## Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$31.50 to \$32.50
No. 2 hvy. melting	28.50 to 29.50
No. 1 bundles	31.50 to 32.50
No. 2 bundles	22.50 to 23.50
Machine shop turn.	16.50 to 17.50
Mixed bor. and turn.	17.50 to 18.50
Shoveling turnings	19.50 to 20.50
Cast iron borings	17.50 to 18.50
Low phos. 18 in. & under	37.00 to 38.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	40.00 to 41.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	44.00 to 45.00

## San Francisco

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 3 bundles	21.00
Machine shop turn.	10.00
Cast iron borings	9.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	40.00

## Los Angeles

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	20.00
Machine shop turn.	8.00
Shoveling turnings	10.00
Cast iron borings	10.00
Elec. furn. 1 ft. and under	30.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	\$41.00 to 42.00

## Seattle

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	29.00
No. 2 bundles	32.00
No. 3 bundles	19.00
No. 1 cupola cast.	25.00
Mixed yard cast.	25.00

## Hamilton, Ont.

No. 1 hvy. melting	\$34.00
No. 2 hvy. melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Bushings	28.00
Bush., new fact prep'd	22.00
Bush., new fact unprep'd	28.00
Short steel turnings	\$16.00 to 17.00
Mixed bor. and turn.	16.00 to 17.00
Rails, rerolling	42.00
Cast scrap	42.00 to 45.00

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# Price Fix Rhodesian Copper

**Rhodesian Selection Trust establishes 35¢ per lb price level for 30 days . . . Move is designed to stabilize market . . . Lead and zinc stockpiling will continue.**

◆ IN A MOVE designed to stabilize erratic copper prices, the Rhodesian Selection Trust late last week fixed the price of copper at a level of £280 per long ton (35¢ per lb) c.i.f. United Kingdom for the next 30 days.

The new price affects only the output of the Roan Antelope and Mulfulira copper mines which produce about one-third of the copper used by Britain. Rest of the copper imported by the U. K., including production from the big Nchanga and Rhokana mines, will be priced in accordance with quotations on the London Metal Exchange as before.

Reason behind the price fixing attempt company officials say is to make the resale price of copper and brass products more stable. General reaction of copper users both here and in London to the price stabilizing attempt was favorable. In welcoming the new price action, the British Non-Ferrous Metals Federation said the high, fluctuating price of copper is causing copper consumers to consider substitutes.

Other important news affecting copper came from Chile, where the much discussed copper bill designed to improve operating conditions for U. S. copper producers was finally enacted into law. The new law ends discriminatory exchange rates, changes the tax setup, and most

importantly—as far as copper consumers are concerned—gives the companies (Anaconda and Kennecott) control of sales of their copper abroad instead of its being marketed by the Chilean Bank as before.

One result of this new legislation may be that the U. S. will get a larger share of the copper exported from Chile. However, this will not have any immediate effect in easing the domestic copper shortage since output from mines in Chile is sold out into October.

**LEAD, ZINC . . .** Government will continue, at least for the next 20 months, purchasing lead and zinc for the stockpile.

Office of Defense Mobilization says that present status of the stockpile indicates the government will be able to continue buying lead and zinc throughout 1955 and probably in 1956, as well.

President Eisenhower last August ordered the stockpile purchase program after a U. S. Tariff Commission ruling that imports were seriously damaging the lead and zinc industry in this country. Goal set then was for purchase of up to 300,000 tons of zinc in the fiscal year ending next June 30. ODM's announcement that stockpiling would continue was contained in a letter from ODM Director Arthur S. Flemming to Sen. Wallace Bennett, R., Utah.

Sen. Bennett says he considers Mr. Flemming's announcement a "virtual guarantee" that the program will con-

tinue for at least another 20 months, and says it is "the most positive long-range promise the mining industry has yet been able to obtain."

Statistics on slab zinc smelter output show a decline in April compared to March, as production dipped to 83,804 tons compared with the previous month's 89,179 tons. Shipments, however, skyrocketed to 90,729 tons compared to 79,720 tons in March.

Though shipments to the government slipped off as they have ever since the first of the year, net effect of the decrease in production and the overall increase in shipments was to trim smelters' stocks to 74,745 tons compared to the previous month's 90,837 level.

Reflecting the strong demand for Special High Grade zinc, output of this grade jumped nearly 10,000 tons in April to a level of 39,296 tons.

**ALUMINUM . . .** Primary aluminum tagged for exclusive use by plants handling military, atomic energy, and defense-related orders in the July-September quarter will amount to 66,500 tons.

This is 1000 tons less than the total earmarked for similar orders in the current quarter. In each instance, however, the setaside is 15 pct of the anticipated domestic and imported aluminum supply for the period.

Reason for the drop in the setaside requirement for the coming quarter is a change in military needs, says the U. S. Commerce Dept.

Meeting between Business & Defense Services Administration and the Primary Aluminum Producers Industry Advisory Committee is scheduled for May 20. Up for discussion at this meeting will be the overall aluminum supply situation and aluminum stockpile needs during the last half of the year.

Following is a breakdown of shipments of aluminum mill products during February and March which shows a big jump in sheet, plate and castings:

ALUMINUM MILL PRODUCT SHIPMENTS  
NET TONS

	Mar. '55	Feb. '55
Sheet and Plate, total	59,101	50,820
Non-Heat-Treatable	45,814	39,114
Heat-Treatable	13,287	11,706
Foil	8,337	7,995
Extruded Products, total	16,002	15,121
Soft Alloys	14,238	13,253
Hard Alloys	1,764	1,868
Tube, Drawn, total	3,890	3,193
Soft Alloys	3,606	3,010
Hard Alloys	285	183
Rod & Bar, Rolled	7,678	6,312
ACSR & Cable, Bare	5,079	4,880
Wire, Other than Conductor	2,005	1,723
Forgings	2,204	1,949
Castings, total	17,832	15,167
Sand	967	873
Permanent Mold	8,333	4,904
Die	8,533	7,390

## Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	May 4	May 5	May 6	May 7	May 9	May 10
Copper, electro, Conn.	36.00	36.00	36.00	36.00	36.00	36.00
Copper, Lake, delivered	36.00	36.00	36.00	36.00	36.00	36.00
Tin, Straits, New York	91.25	90.875	90.75		91.125	91.125*
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	12.00
Lead, St. Louis	14.80	14.80	12.00	14.80	14.80	14.80

Note: Quotations are going prices

\*Tentative



# Nonferrous Prices (Effective May 10, 1955)

## MILL PRODUCTS

(Cents per lb, unless otherwise noted)

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet			Plate
	0.032 in.	0.081 in.	0.136 in.	0.250 in.
1100, 3003.....	39.1	37.1	35.0	35.5
3004.....	44.0	39.8	38.1	37.6
5052.....	45.7	41.9	40.2	39.3
5054-O, OAL.....	49.4	40.8	39.3	39.4
7075-O, OAL.....	60.8	49.1	46.8	46.8

**Extruded Solid Shapes:** Shape factors 1 to 8, 88.7¢ to 96.7¢; 12 to 14, 99.4¢ to \$1.04; 24 to 26, 42.2¢ to \$1.35; 36 to 38, 49.5¢ to \$1.97.  
**Rod, Round:** Rolled, 1.064-4.6 in., 1100-F, 48.6¢ to 46.1¢; cold finished, 0.875-3.499 in., 1100-F, 47.9¢ to 42.4¢.  
**Screw Machine Stock:** Rounds, 2011-T3, 1/4-11/32 in., 63.5¢ to 50.1¢; 1/4-1/2 in., 49.9¢ to 46.9¢; 1/2-1/4 in., 46.7¢ to 42.7¢. Base 5000 lb.  
**Drawn Wire:** Coiled, 0.061-0.374 in., 1100, 47.1¢ to 35.5¢; 0.062, 56.7¢ to 44.4¢; 2017-T4, 54.3¢ to 44.7¢; 6061-T4, 89.5¢ to 44.1¢.  
**Extruded Tubing:** Rounds, 6063-T5, OD 1/4-3 in., 44.4¢ to 54.5¢; 2-4 in., 40.3¢ to 54.5¢; 4-8 in., 40.5¢ to 49.8¢; 8-9 in., 41.4¢ to 52.1¢.  
**Rolling Sheet:** Flat, per sheet, 0.032-in., 42% x 60-in., \$2.998; x 96-in., \$4.801; x 120-in., \$6.002; x 144-in., \$7.202. Coiled sheet, per lb, 8.919 in. x 28 in., 30.9¢.

## Magnesium

(F.o.b. mill, freight allowed)

**Sheet & Plate:** FS1-O 1/4 in., 59¢; 3/16 in., 60¢; 1/8 in., 59¢; 0.064 in., 76¢; 0.032 in., 97¢. Specification grade higher. Base 30,000 lb.  
**Extruded Round Rod:** M, diam 1/4 to 0.311 in., 79¢; 1/2 to 5 in., 62.6¢; 1/4 to 1.749 in., 59¢; 2 1/2 to 5 in., 84.5¢. Other alloys higher.  
**Base up to 3 in. diam, 10,000 lb; 3 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.**  
**Extruded Solid Shapes:** Rectangles: M, in weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 67.3¢; 0.22 to 0.25 lb, 5.9 in., 64.3¢; 0.50 to 0.59 lb, 8.6 in., 61.7¢; 1.8 to 2.59 lb, 19.5 in., 69.5¢; 4 to 6 lb, 28 in., 55¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/4 lb, 10,000 lb; 1/4 to 1.90 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.  
**Extruded Round Tubing:** M, 0.049 to 0.057 in. wall thickness: OD 1/4 to 5/16 in., \$1.46; 5/16 to 1/2 in., \$1.32; 1/2 to 3/4 in., \$1.16; 3/4 to 1 in., \$1.02; 1 to 2 in., \$0.82; 2 to 3 in., \$0.67; 3 to 4 in., \$0.62. Other alloys higher. Base, OD: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

## Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$9; Forgings, \$9.

## Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel Monel	Inconel
Sheet, CR.....	102	78
Strip, CR.....	103	87
Rod, Bar, HR.....	87	69
Angles, HR.....	87	69
Plate, HR.....	97	82
Seamless Tube.....	122	108
Shot, Blocks.....	85	85

## Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper.....	52.75	51.11	54.56
Copper, h.R. or CR.....	54.75	51.11	54.56
Copper, drawn.....	52.36	51.11	54.56
Low brass.....	49.75	49.69	49.69
Yellow brass.....	46.37	46.21	46.21
Red brass.....	50.99	50.93	50.93
Naval brass.....	44.30	44.30	44.30
Lead brass.....	43.09	43.09	43.09
Com. bronze.....	52.78	52.72	52.72
Mang. bronze.....	52.73	47.82	49.39
Phos. bronze.....	73.03	73.53	73.53
Muntz metal.....	45.14	45.95	45.20
Ni alloy, 10 pct Co.....	60.20	63.28	66.24
Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b.....			
Strip.....			\$1.74
Rod, bar, wire.....			1.71

## PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed.....	33.20
Aluminum pig.....	31.50
Antimony, American, Laredo, Tex.....	38.50
Beryllium copper, per lb cont'd Be.....	\$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be.....	\$72.25
Bismuth, ton lots.....	\$3.26
Cadmium, del'd.....	\$1.70
Cobalt, 97-99% (per lb).....	\$3.60 to \$2.67
Copper, electro, Conn. Valley.....	36.00
Copper, Lake, delivered.....	36.00
Gold, U. S. Treas., per troy oz.....	\$35.00
Indium, 99.5%, dollars per troy oz.....	\$3.25
Iridium, dollars per troy oz.....	\$90 to \$100
Lead, St. Louis.....	14.80
Lead, New York.....	15.00
Magnesium, 99.8-9%, f.o.b. Freeport, Tex., 10,000 lb, pig.....	25.50
Ingot.....	29.25
Magnesium, sticks, 100 to 500 lb.....	49.00
Mercury, dollars per 76-lb flask, f.o.b. New York.....	\$311 to \$312
Nickel electro, f.o.b. N. Y. warehouse.....	67.67
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel.....	60.75
Palladium, dollars per troy oz.....	\$18 to \$20
Platinum, dollars per troy oz.....	\$76 to \$79
Silver, New York, cents per troy oz.....	\$7.00
Tin, New York.....	\$1.125
Titanium, sponge, grade A-1.....	\$3.95
Zinc, East St. Louis.....	12.00
Zinc, New York.....	12.50
Zirconium copper, 50 pct.....	\$6.20

## REMELTED METALS

### Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot.....	35.50
No. 115.....	35.00
No. 120.....	35.00
No. 123.....	34.50
80-10-10 ingot.....	39.00
No. 305.....	37.25
No. 315.....	39.00
88-10-2 ingot.....	48.75
No. 210.....	45.25
No. 215.....	40.75
No. 245.....	40.75
Yellow ingot.....	39.75
No. 405.....	39.75
Manganese bronze.....	33.25
No. 421.....	33.25

### Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys.....	29.50-30.00
0.30 copper, max.....	29.25-29.75
0.60 copper, max.....	27.50-29.00
Piston alloys (No. 122 type).....	27.00-28.00
No. 12 alum. (No. 2 grade).....	27.50-28.50
108 alloy.....	29.00-29.75
195 alloy.....	29.25-29.75
13 alloy (0.60 copper max.).....	27.50-28.50
ASX-679.....	27.50-28.50

### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2%.....	27.75-28.50
Grade 2—92-95%.....	27.25-28.00
Grade 3—90-92%.....	26.25-27.25
Grade 4—85-90%.....	25.25-26.75

## ELECTROPLATING SUPPLIES

(Cents per lb, freight allowed, 5000 lb lots)

<b>Anodes</b>	
Copper.....	44.92
Cast, oval, 15 in. or longer.....	39.78
Electrodeposited.....	45.42
Flat rolled.....	45.42
Brass, 80-20.....	43.515
Cast, oval, 15 in. or longer.....	30.25
Zinc, flat cast.....	18.50
Ball, anodes.....	90.50*
Nickel, 99 pct plus.....	\$1.70
Cadmium.....	94 1/2
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.....	

## Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum.....	63.00
Copper sulphate, 99.5 crystals, bbl.....	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed.....	31.35*
Nickel chloride, 300 to 400 lb.....	43.50*
Silver cyanide, 100 oz. lots, per oz.....	75 1/2
Sodium cyanide, 96 pct domestic 200 lb drums.....	19.25
Zinc cyanide, 100 lb drum.....	54.30
*Effective Jan. 3.	

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	32 1/2	31 1/4
Yellow brass.....	23 1/2	22 1/2
Red brass.....	28 1/2	27 1/2
Comm. bronze.....	29 1/2	28 1/2
Mang. bronze.....	22 1/6	21 1/2
Yellow brass rod ends.....	23 1/2	22

### Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	32 1/2
No. 2 copper wire.....	31
Light copper.....	29 1/2
*Refinery brass.....	29 1/2
*Dry copper content.	

### Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	32
No. 2 copper wire.....	30 1/2
Light copper.....	28 1/2
No. 1 composition.....	27
No. 1 comp. turnings.....	26 1/2
Roller brass.....	20
Brass pipe.....	19 1/2
Radiators.....	20 1/2

### Aluminum

Mixed old cast.....	16 —17
Mixed new clips.....	17 1/2—18 1/2
Mixed turnings, dry.....	16 1/2—17

### Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

### Copper and Brass

No. 1 heavy copper and wire.....	29 1/2—30
No. 2 heavy copper and wire.....	28 1/2—29
Light copper.....	26 1/2—27
New type shell cuttings.....	26 1/2—27
Auto radiators (unsweated).....	17 1/2—18
No. 1 composition.....	24 1/2—25
No. 1 composition turnings.....	23 1/2—24
Unlined red car boxes.....	18 1/2—19
Cocks and faucets.....	20 —20 1/2
Mixed heavy yellow brass.....	18 —18 1/2
Old rolled brass.....	20 —20 1/2
Brass pipe.....	21 1/2—22
New soft brass clippings.....	20 1/2—21
Brass rod ends.....	19 1/2—20
No. 1 brass rod turnings.....	19 1/2—20

### Aluminum

Alum. pistons and struts.....	13 1/2—14
Aluminum crankcases.....	14 —14 1/2
1100 (28) aluminum clippings.....	17 —17 1/2
Old sheet and utensils.....	13 1/2—14
Borings and turnings.....	9 —9 1/2
Misc. cast aluminum.....	13 1/2—14
2024 (24s) clippings.....	15 —15 1/2

### Zinc

New zinc clippings.....	7 1/2
Old zinc.....	4 1/2—5
Zinc routings.....	3 —3 1/2
Old die cast scrap.....	3 1/2—3 3/4

### Nickel and Monel

Pure nickel clippings.....	57
Clean nickel turnings.....	40
Nickel anodes.....	57
Nickel rod ends.....	57
New Monel clippings.....	21
Clean Monel turnings.....	26
Old sheet Monel.....	26
Nickel silver clippings, mixed.....	16 1/2
Nickel silver turnings, mixed.....	13 1/2

### Lead

Soft scrap lead.....	11 1/2—11 3/4
Battery plates (dry).....	6 —6 1/2
Batteries, acid free.....	4 1/2

### Magnesium

Segregated solids.....	18 1/2—19
Castings.....	17 1/2—18

### Miscellaneous

Block tin.....	76 —77
No. 1 pewter.....	58 —59
No. 1 auto babbitt.....	37 —38
Mixed common babbitt.....	12 —12 1/2
Solder joints.....	17 —17 1/2
400 tops.....	15
Small foundry type.....	16 1/2
Monotype.....	15
Lino. and stereotype.....	13 1/2—14
Electrotype.....	12 —12 1/2
Hand picked type shells.....	9 1/2
Lino. and stereo. dross.....	6 1/2
Electro dross.....	8

## IRON AGE

STEEL  
PRICES(Effective  
May 10, 1955)

Italic identifies producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
	Carbon Rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.		\$66.00 B3		4.30 B3	6.45 B3	4.30 B3						
	Buffalo, N. Y.	\$64.00 B3	\$78.00 B3, R3	\$66.00 B3, R3	5.975 B3	4.30 B3	6.45 B3	4.30 B3	4.95 B3,R3	5.75 R7, S10	6.15 B3	6.425 B3	
	Claymont, Del.												
	Harrison, N. J.												12.45 C11
	Conschohocken, Pa.							4.10 A2	5.90 A2	6.15 A2			
	New Bedford, Mass.								6.20 R6				
	Johnstown, Pa.	\$64.00 B3	\$78.00 B3	\$66.00 B3		4.30 B3	6.45 B3	4.95 B3					
	Fairless, Pa.												
	New Haven, Conn.								6.20 D1 6.50 A3				
	Phoenixville, Pa.				4.20 P2		4.30 P2						
	Sparrows Pt., Md.							4.95 B3	5.75 B3	6.15 B3	6.425 B3		
	Bridgeport, Wallingford, Conn.	\$60.00 N8	\$83.00 N8					4.35 N8	6.20 W1			7.90 N8	
	Peweechot, R. I. Wareham, Mass.								6.30 N7 6.60 A3				12.75 A3 12.90 N7
MIDDLE WEST	Alton, Ill.							4.225 L1					
	Ashland, Ky.							4.05 A7					
	Canton-Massillon, Dover, Ohio		\$60.00 R3	\$66.00 R3, T3									12.45 G4
	Chicago, Ill.	\$64.00 U1	\$78.00 R3, U1,W8	\$66.00 U1, H8,R3	5.975 U1	4.25 U1, W8	6.40 U1, Y1	4.25 U1	4.95 A1,N4 W8	5.95 A1			
	Cleveland, Ohio								5.75 A3,J3		6.60 A5		12.45 A5
	Detroit, Mich.			\$66.00 R5				4.15 G3,M2	5.85 D1,D2, G3,M2,P11	6.25 G3	6.70 D2, G3		
	Duluth, Minn.												
	Gary, Ind. Harbor, Indiana	\$64.00 U1	\$78.00 U1	\$66.00 U1, Y1	5.975 J3	4.25 J3, U1	6.40 U1, J3	4.05 J3, U1,Y1	5.95 J3	6.15 U1, J3,Y1	6.60 Y1	6.70 U1, Y1	
	Stirling, Ill.							4.15 N4					
	Indianapolis, Ind.								5.90 C5				
	Newport, Ky.											6.70 Y5	
	Middletown, Ohio								5.75 A7				
	Niles, Warren, Ohio Sharon, Pa.							4.95 S1,R3	5.75 S1,R3, T4	6.15 S1, R3	6.60 S1, R3	6.70 S1	12.45 S1
WEST	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$64.00 U1, J3	\$78.00 J3, U1,C11	\$66.00 U1, C11	5.975 U1	4.25 J3, U1	6.40 J3, U1	4.25 U1	4.95 P6	5.75 B4,J3, S7		6.70 S9	12.45 S9
	Portsmouth, Ohio							4.95 P7	5.75 P7				
	Weirton, Whodding, Follansbee, W. Va.					4.25 W3		4.95 W3	5.75 F3,W3	6.15 W3	6.60 W3		
	Youngstown, Ohio		\$78.00 C10	\$66.00 Y1, C10		4.25 Y1	6.40 Y1	4.95 U1,Y1	5.75 Y1,C3	6.15 U1, Y1	6.60 Y1	6.70 U1, Y1	12.45 C3
	Fentana, Cal.	\$72.00 K1	\$66.00 K1	\$105.00 K1		4.90 K1	7.95 K1	5.25 K1	4.825 K1	7.50 K1	7.25 K1	8.10 K1	14.55 K1
	Genova, Utah		\$78.00 C7			4.25 C7	6.40 C7						
	Kansas City, Mo.					4.30 S2	6.45 S2				6.40 S2	6.95 S2	
	Los Angeles, Torrance, Cal.		\$87.50 B2	\$106.00 B2		4.95 B2, C7	7.10 B2	4.80 B2,C7	7.80 C1				
	Minneapolis, Colo.					4.70 C6		5.15 C6					
	Portland, Ore.					5.80 O2							
	San Francisco, Niles, Pittsburgh, Cal.		\$87.50 B2			4.90 B2 4.95 P9	7.85 B2	4.80 B2,C7					
	Seattle, Wash.		\$91.50 B2			5.00 B2	7.15 B2	5.95 B2, P12					
SOUTH	Atlanta, Ga.							4.25 A8					
	Fairfield, Ala. City, Birmingham, Ala.	\$64.00 T2	\$78.00 T2			4.25 C16, R3,T2	6.40 T2			6.15 T2			
	Houston, Lone Star, Tex.	\$70.00 L3	\$83.00 S2	\$91.00 S2		4.30 S2	6.43 S2			6.40 S2		6.95 S2	

IRON AGE		States identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.											
STEEL PRICES (Effective May 10, 1955)		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & byvr.	Cold-rolled	Galvanized 18 ga.	Enamel- ing 12 ga.	Long Terme 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.	Cokes* 7.25-lb. base box	Electro* 9.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.85 B3	4.95 B3				6.10 B3	7.50 B3		4.875 W6	† Special coated mfg. terms deduct 95¢ from 1.25-lb. cokes base box price. Con-making quality blackplate 55 to 125 lb. deduct \$2.20 from 1.25-lb. cokes base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.10. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.10 A2	5.00 A2				6.15 A2						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									4.875 B3			
	Fairless, Pa.	4.10 U1	5.00 U1				6.15 U1	7.55 U1			\$8.90 U1	\$7.60 U1	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.05 B3	4.95 B3	5.45 B3			6.10 B3	7.50 B3	8.20 B3	4.775 B3	\$8.90 B3	\$7.60 B3	
MIDDLE WEST	Worcester, Mass.									4.975 A5			
	Trenton, N. J.												
	Alton, Ill.									4.85 L1			
	Ashland, Ky.	4.05 A7		5.45 A7	5.375 A7								
	Canton-Massillon, Dover, Ohio			5.45 R1, R3						5.175 R1			
	Chicago, Joliet, Ill.	4.05 A1, W8					6.10 U1			4.875 A5, N4, R3			
	Sterling, Ill.									4.775 N4			
	Cleveland, Ohio	4.05 J3, R3	4.95 J3, R3		5.375 R3		6.10 J3, R3	7.50 J3, R3		4.875 A5			
	Detroit, Mich.	4.15 G3, M2	5.05 G3				6.20 G3	7.60 G3					
	Newport, Ky.	4.05 N5	4.95 N5	5.45 N5									
	Gary, Ind. Harbor, Indiana	4.05 J3, U1, Y1	4.95 J3, U1, Y1	5.45 U1, J3	5.375 J3, U1	5.95 U1	6.10 U1, J3, Y1	7.50 U1, Y1		4.875 Y1	\$8.90 J3, U1, Y1	\$7.50 J3, U1, Y1	6.20 U1, Y1
WEST	Granite City, Ill.	4.25 G2	5.15 G2	5.65 G2	5.375 G2							\$7.60 G2	6.30 G2
	Kokomo, Ind.	4.15 C9		5.55 C9						5.20 C9	4.775 C9		
	Mansfield, Ohio					5.85 E2				5.175 E2			
	Middletown, Ohio		4.95 A7		5.375 A7	5.85 A7							
	Niles, Warren, Ohio Sharon, Pa.	4.05 S1, R3 5.30 N3	4.95 R3 5.975 N3	5.45 N3, R3	6.725 N3	5.85 N3	6.10 S1, R3	7.50 R3			\$8.90 R3	\$7.50 R3	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.05 J3, U1, P6	4.95 J3, U1, P6	5.45 U1	5.375 U1		6.10 J3, U1	7.50 J3, U1	8.20 U1	4.875 A5 4.875 P6	\$8.90 J3, U1	\$7.50 J3, U1	6.20 U1
	Portsmouth, Ohio	4.05 P7	4.95 P7							4.875 P7			
	Weirton, Wheeling, Follansbee, W. Va.	4.05 W3, W5	4.95 W3, W5, F3	5.45 W3, W5		5.85 W3, W5	6.10 W3	7.50 W3			\$8.90 W3, W5	\$7.50 W3, W5	6.20 F3, W5
	Youngstown, Ohio	4.05 U1, Y1	4.95 Y1		5.375 Y1		6.10 U1, Y1	7.50 Y1		4.875 Y1			
	Fontana, Cal.	4.825 K1	6.05 K1				6.875 K1	8.55 K1		5.675 K1			
	Geneva, Utah	4.15 C7											
SOUTH	Kansas City, Mo.									4.925 S2			
	Los Angeles, Torrance, Cal.									5.675 C7, B3			
	Minnequa, Colo.									4.925 C6			
	San Francisco, Niles, Pittsburg, Cal.	4.75 C7	5.90 C7	6.20 C7						5.325 C7	\$9.55 C7	\$8.25 C7	
	Seattle, Wash.												
	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala. Houston, Tex.	4.05 R3, T2	4.95 T2	5.45 R3, T2			6.10 T2			5.35 R3 4.875 T2, R3	\$8.90 T2	\$7.60 T2	

## IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

**STEEL  
PRICES**(Effective  
May 10, 1955)

	BARS						PLATES				WIRE
	Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Flat Plate	Alloy	Hi Str. Low Alloy	
<b>EAST</b>											
Bethlehem, Pa.				5.075 B3	6.625 B3	6.45 B3					
Buffalo, N. Y.	4.30 B3,R3	4.30 B3,R3	5.45 B3	5.075 B3,R3	6.625 B3,B5	6.45 B3	4.225 B3,R3			6.45 B3	5.75 W6
Claymont, Del.							4.225 C4		5.80 C4		
Cantonville, Pa.							4.225 L4		5.80 L4	6.45 L4	
Conshohocken, Pa.							4.225 A2	5.275 A2		6.45 A2	
Harrisburg, Pa.							4.225 C3	5.275 C3			
Hartford, Conn.			5.90 R3		6.925 R3						
Johnstown, Pa.	4.30 B3	4.30 B3		5.075 B3		6.45 B3	4.225 B3		5.80 B3	6.45 B3	5.75 B3
Phenix, Pa.	4.45 U1	4.45 U1		5.225 U1							
Newark, N. J.			5.85 W10		6.80 W10						
Camden, N. J.			5.85 P10								
Bridgeport, Putnam, Conn.	4.55 N8		5.95 W10	5.225 N8			4.475 N8				
Sparrows Pt., Md.		4.30 B3					4.225 B3		5.80 B3	6.45 B3	5.85 B3
Palmer, Worcester, Randolph, Mansfield, Mass.			5.85 W11 5.95 B3,C14		6.925 A5,B5						6.05 A5, W6
<b>MIDDLE WEST</b>											
Akron, Ill.	4.50 L1										5.925 L1
Ashland, Newport, Ky.							4.225 A7,N5		5.80 N5		
Canton-Macellon, Mansfield, Ohio	4.40 R3		5.40 R2,R3	5.075 R3,T3	6.625 R2,R3,T3		4.225 E2				
Chicago, Joliet, Ill.	4.30 U1, N4,W8,R3, P13	4.30 N4,R3, P13	5.40 A5,W10, W8,B5,L2	5.075 U1,R3, W8	6.625 A5,W8, W10,L2,B5		4.225 U1,W8, I3,A1,R3	5.275 U1	5.80 U1	6.45 U1	5.75 A5, R3,N4,W7
Cleveland, Ohio	4.30 R3	4.30 R3	5.40 A5,C13		6.625 A5,C13	6.45 R3	4.225 J3,R3	5.275 J3		6.45 J3,R3	5.75 A5, C13
Detroit, Mich.	4.40 G3 4.45 R3		5.40 R5 5.80 R5,P8 5.85 P3	5.075 R5 5.175 G3	6.625 R5 6.825 R5,P3 P8	6.55 G3	4.225 G3			6.55 G3	
Duluth, Minn.											5.75 A5
Gary, Ind. Harbor, Gravelandville	4.30 I3, U1, Y1	4.30 I3, U1, Y1	5.40 M5,R3	5.075 I3, U1, Y1	6.625 M5, R3	6.45 U1,I3, Y1	4.225 I3, U1, Y1	5.275 I3	5.80 U1,Y1	6.45 U1,I3, Y1	5.85 M4
Granite City, Ill.							4.425 G2				
Kokomo, Ind.											5.85 C9
Stirling, Ill.	4.40 N4	4.40 N4									5.85 N4
Niles, Ohio Sharon, Pa.	4.30 R3					6.45 R3	4.225 S1,R3		5.80 S1	6.45 S1	
Pittsburgh, Pa. Midland, Pa.	4.30 J3, U1, C11	4.30 J3, U1	5.40 A5,C8, C11,J3, W10,B4,R3	5.075 U1,C11	6.625 A5,C11, W10,C8,R3	6.45 J3, U1	4.225 J3, U1	5.275 U1	5.80 U1	6.45 J3, U1	5.75 A5,J3, P6
Portsmouth, Ohio											5.75 P7
Watson, Wheeling, Follansbee, W. Va.	4.30 W3						4.225 W3, W3				
Youngstown, Ohio	4.30 U1, Y1, C10,R3	4.30 U1, Y1, R3	5.40 F2,Y1, C10	5.075 U1,Y1, C10	6.625 Y1,C10 6.665 F2	6.45 U1,Y1	4.225 U1, Y1, R3		5.80 Y1	6.45 Y1	5.75 Y1
<b>WEST</b>											
Emeryville, Cal.	5.05 J5	5.05 J5									
Fountain, Cal.	5.00 K1	5.00 K1		6.125 K1		7.70 K1	4.875 K1		6.45 K1	7.15 K1	
Geneva, Utah							4.225 C7			6.45 C7	
Kansas City, Mo.	4.80 S2	4.85 S2		5.325 S2		6.70 S2					6.90 S2
Los Angeles, Torrance, Cal.	5.00 B2,C7	5.00 B2,C7	6.85 R3	6.125 B3		7.15 B2					6.70 B2
Minneapolis, Colo.	4.75 C8	4.75 C8					5.075 C6				6.00 C6
Portland, Ore.	5.05 O2	5.05 O2									
San Francisco, Niles, Pittsburg, Cal.	5.00 C7,P9 5.05 B2	5.00 C7,P9 5.05 B2				7.30 B2					6.70 C7
Seattle, Wash.	5.05 B2,P12, N6	5.05 B2,P12				7.30 B2	5.125 B2		6.70 B2	7.35 B2	
<b>SOUTH</b>											
Atlanta, Ga.	4.50 A8	4.50 A8									5.95 A8
Fairfield, Ala. City, Birmingham, Ala.	4.30 T2,C16, R3	4.30 T2,C16, R3				6.45 T2	4.225 T2,R3			6.45 T2	5.75 R3, T2
Houston, Ft. Worth, Lone Star, Tex.	4.55 S2	4.55 S2		5.325 S2		6.70 S2	4.55 L3 4.275 S2		5.85 S2	6.50 S2	6.00 S2



(Effective May 10, 1955)

**Steel Prices****Key to Steel Producers**

With Principal Offices

- A1 Acme Steel Co., Chicago  
 A2 Alan Wood Steel Co., Conshohocken, Pa.  
 A3 Allegheny Ludlum Steel Corp., Pittsburgh  
 A4 American Cimetals Co., Carnegie, Pa.  
 A5 American Steel & Wire Div., Cleveland  
 A6 Angell Nail & Chaplet Co., Cleveland  
 A7 Armco Steel Corp., Middletown, O.  
 A8 Atlantic Steel Co., Atlanta, Ga.  
 B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
 B2 Bethlehem Pacific Coast Steel Corp., San Francisco  
 B3 Bethlehem Steel Co., Bethlehem, Pa.  
 B4 Blair Strip Steel Co., New Castle, Pa.  
 B5 Bliss & Laughlin, Inc., Harvey, Ill.  
 C1 Calstrip Steel Corp., Los Angeles  
 C2 Carpenter Steel Co., Reading, Pa.  
 C3 Central Iron & Steel Co., Harrisburg, Pa.  
 C4 Claymont Products Dept., Claymont, Del.  
 C5 Cold Metal Products Co., Youngstown, O.  
 C6 Colorado Fuel & Iron Corp., Denver  
 C7 Columbia Geneva Steel Div., San Francisco  
 C8 Columbia Steel & Shifting Co., Pittsburgh  
 C9 Continental Steel Corp., Kokomo, Ind.  
 C10 Copperweld Steel Co., Pittsburgh, Pa.  
 C11 Crucible Steel Co. of America, Pittsburgh  
 C12 Cumberland Steel Co., Cumberland, Md.  
 C13 Cuyahoga Steel & Wire Co., Cleveland  
 C14 Compressed Steel Shifting Co., Readville, Mass.  
 C15 G. O. Carlson, Inc., Thorndale, Pa.  
 C16 Connors Steel Div., Birmingham  
 D1 Detroit Steel Corp., Detroit  
 D2 Detroit Tube & Steel Div., Detroit  
 D3 Driver Harris Co., Harrison, N. J.  
 D4 Dickson Weatherproof Nail Co., Evanston, Ill.  
 D5 Henry Duxton & Sons, Inc., Philadelphia  
 E1 Eastern Stainless Steel Corp., Baltimore  
 E2 Empire Steel Co., Mansfield, O.  
 F1 Firth Sterling, Inc., McKeesport, Pa.  
 F2 Fitzsimmons Steel Corp., Youngstown  
 F3 Follansbee Steel Corp., Follansbee, W. Va.  
 G1 Globe Iron Co., Jackson, O.

- G2 Granite City Steel Co., Granite City, Ill.  
 G3 Great Lakes Steel Corp., Detroit  
 G4 Greer Steel Co., Dover, O.  
 H1 Hanna Furnace Corp., Detroit  
 I2 Ingersoll Steel Div., Chicago  
 I3 Inland Steel Co., Chicago  
 I4 Interlake Iron Corp., Cleveland  
 J1 Jackson Iron & Steel Co., Jackson, O.  
 J2 Jessop Steel Corp., Washington, Pa.  
 J3 Jones & Laughlin Steel Corp., Pittsburgh  
 J4 Joslyn Mfg. & Supply Co., Chicago  
 J5 Judson Steel Corp., Emeryville, Calif.

- K1 Kaiser Steel Corp., Fontana, Cal.  
 K2 Keystone Steel & Wire Co., Penira  
 K3 Koppers Co., Granite City, Ill.  
 L1 Laclede Steel Co., St. Louis  
 L2 La Salle Steel Co., Chicago  
 L3 Lone Star Steel Co., Dallas  
 L4 Lukens Steel Co., Coatesville, Pa.

- M1 Mahoning Valley Steel Co., Niles, O.  
 M2 McLouth Steel Corp., Detroit  
 M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
 M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.  
 M5 Monarch Steel Div., Hammond, Ind.  
 M6 Mystic Iron Works, Everett, Mass.  
 N1 National Supply Co., Pittsburgh  
 N2 National Tube Div., Pittsburgh  
 N3 Niles Rolling Mill Div., Niles, O.  
 N4 Northwestern Steel & Wire Co., Sterling, Ill.  
 N5 Newport Steel Corp., Newport, Ky.  
 N6 Northwest Steel Rolling Mills, Seattle  
 N7 Newman Crosby Steel Co., Pawtucket, R. I.  
 N8 Northeastern Steel Corp., Bridgeport, Conn.

- O1 Oliver Iron & Steel Co., Pittsburgh  
 O2 Oregon Steel Mills, Portland  
 P1 Page Steel & Wire Div., Monessen, Pa.  
 P2 Phoenix Iron & Steel Co., Phoenixville, Pa.  
 P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
 P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
 P5 Pittsburgh Screw & Bolt Co., Pittsburgh  
 P6 Pittsburgh Steel Co., Pittsburgh  
 P7 Portsmouth Div., Detroit Steel Corp., Detroit

- P8 Plymouth Steel Co., Detroit  
 P9 Pacific States Steel Co., Niles, Cal.  
 P10 Precision Drawn Steel Co., Camden, N. J.  
 P11 Production Steel Strip Corp., Detroit  
 P12 Pacific Steel Rolling Mills, Seattle  
 P13 Phenox Mfg. Co., Joliet, Ill.  
 R1 Reeves Steel & Mfg. Co., Dover, O.  
 R2 Reliance Div., Eaton Mfg. Co., Massillon, O.  
 R3 Republic Steel Corp., Cleveland  
 R4 Roebing Sons Co., John A., Trenton, N. J.  
 R5 Rotary Electric Steel Co., Detroit  
 R6 Rodney Metals, Inc., New Bedford, Mass.  
 R7 Rome Strip Steel Co., Rome, N. Y.  
 S1 Sharon Steel Corp., Sharon, Pa.  
 S2 Sheffield Steel Corp., Kansas City  
 S3 Shenango Furnace Co., Pittsburgh  
 S4 Simonds Saw & Steel Co., Fitchburg, Mass.  
 S5 Sweet's Steel Co., Williamsport, Pa.  
 S6 Standard Forging Corp., Chicago  
 S7 Stanley Works, New Britain, Conn.  
 S8 Superior Drawn Steel Co., Monaca, Pa.  
 S9 Superior Steel Corp., Carnegie, Pa.  
 S10 Seneca Steel Service, Buffalo

- T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
 T2 Tennessee Coal & Iron Div., Fairfield  
 T3 Tennessee Products & Chem. Corp., Nashville  
 T4 Thomas Strip Div., Warren, O.  
 T5 Timken Steel & Tube Div., Canton, O.  
 T6 Tremont Nail Co., Wareham, Mass.  
 T7 Texas Steel Co., Fort Worth  
 U1 United States Steel Corp., Pittsburgh  
 U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.  
 U3 Ulbrich Stainless Steels, Wallingford, Conn.  
 U4 U. S. Pipe & Foundry Co., Birmingham

- W1 Wallingford Steel Co., Wallingford, Conn.  
 W2 Washington Steel Corp., Washington, Pa.  
 W3 Weirton Steel Co., Weirton, W. Va.  
 W4 Wheatland Tube Co., Wheatland, W. Va.  
 W5 Wheeling Steel Corp., Wheeling, W. Va.  
 W6 Wickwire Spencer Steel Div., Buffalo  
 W7 Wilson Steel & Wire Co., Chicago  
 W8 Wisconsin Steel Co., S. Chicago, Ill.  
 W9 Woodward Iron Co., Woodward, Ala.  
 W10 Wycoff Steel Co., Pittsburgh  
 W11 Worcester Pressed Steel Co., Worcester, Mass.  
 Y1 Youngstown Sheet & Tube Co., Youngstown

**PIPE AND TUBING**

Base discounts (per) l.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.	
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
Sparrows Pt. B3	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0								
Youngstown R3	23.75	6.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0								
Fontana K1	10.75	+4.5	13.75	+6.5	16.25	3.0	18.75	3.75	19.25	4.75	19.75	5.25	21.25	5.0								
Pittsburgh J3	23.75	6.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Alton, Ill. L1	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0								
Sharon M1	23.75	6.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0								
Fairless N2	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0								
Pittsburgh N1	23.75	6.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Wheeling W5	23.75	6.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0								
Wheatland W4	23.75	6.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0								
Youngstown Y1	23.75	6.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Indiana Harbor Y1	22.75	7.5	25.75	11.5	28.25	15.0	30.75	15.75	31.25	16.75	31.75	17.25	33.25	17.0								
Lorain N2	23.75	6.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
EXTRA STRONG																						
PLAIN ENDS																						
Sparrows Pt. B3	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0								
Youngstown R3	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0								
Fairless N2	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0								
Fontana K1	14.25		18.25		20.25		20.75		21.25		21.75		22.25									
Pittsburgh J3	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75
Alton, Ill. L1	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0								
Sharon M1	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0								
Pittsburgh N1	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75
Wheeling W5	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0								
Wheatland W4	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0								
Youngstown Y1	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75
Indiana Harbor Y1	26.25	12.5	30.25	16.5	32.25	20.0	32.75	18.75	33.25	19.75	33.75	20.75	34.25	19.0								
Lorain N2	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75	26.5	10.75

Through only, butt weld and seamless 2 1/2 pt higher discount. Plain ends, butt weld and seamless, 3-in. and under, 4 1/2 pt higher discount. Butt weld jobs discount, 5 pt.  
 Galvanized discounts based on zinc price range of over 9¢ to 11¢ incl. per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/2, 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12.00¢ per lb.

# Steel Prices

(Effective May 10, 1955)

To identify producers, see Key on preceding page.

## RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rail	Light Rail	Joint Bars	Track Spikes	Score Spikes	Tie Plates	Track Rails Treated
Bessemer U1	4.45	5.35	5.425				
So. Chicago R5				7.30			
Enjay T2	4.45	5.35					
Fairfield T2		5.35		7.30		5.275	
Gary U1	4.45	5.35				5.275	
Ind. Harbor B3	4.45		5.425	7.30		5.275	
Johnstown B3		5.35					
Juliet U1		5.35	5.425				
Kansas City S2				7.30			11.50
Lackawanna B3	4.45	5.35	5.425			5.275	
Minneapolis C6	4.45	5.85	5.425	7.30		5.275	11.50
Pittsburgh O1					11.00		11.50
Pittsburgh P3					11.00		11.50
Seattle B3				7.30			
Steelton B1	4.45		5.425			5.275	
Struthers Y1				7.30			
Terrance C7					5.425		
Williamport S5		5.35					
Youngstown R3				7.30			

## ELECTRICAL SHEETS

F.o.b. Mill Cents Per Lb	22-Gage (Cut Length)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field	8.025	8.225	
Armature	8.50	8.75	9.25
Elect.	9.10	9.35	9.85
Motor	10.10	10.35	10.85
Dynamo	11.00	11.25	11.75
Trans. 72	11.95	12.20	12.70
Trans. 65	12.50		
Trans. 58	13.00	Trans. 80	16.60
Trans. 52	14.00	Trans. 73	17.10

\* Producing points: Beech Bottom (H5); Brackenridge (A5); Granite City (G2); Indiana Harbor (I5); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville (A7).

\* Coils 754 higher.

## CLAD STEEL

Stainless-carbon		Plate	Sheet
No. 304, 20 pct.			
Costsville, Pa., L4		33.60	
Washington, Pa., J2			
Claymont, Del., C6			29.75
New Castle, Ind., J2			
Nickel-carbon			
10 pct. Costsville, Pa., L4		39.50	
Inconel-carbon			
10 pct. Costsville, Pa., L4		47.90	
Mand-carbon			
10 pct. Costsville, Pa., L4		40.80	

\* Includes annealing and pickling, sandblasting.

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails		Woven Wire		Fence 9-15 1/2 in.		Fence Posts		Single Loop Braid Ties		Galv. Barbed and Twisted Barbed Wire		Merch. Wire Ann'd		Merch. Wire "Galv."	
	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal
Alabama City R3	137	146			155	150	6.90									7.30
Altoona, Pa. J3	137	149				156	6.90									7.45
Atlanta A8	139	151			157	164	7.00									7.525
Bartonsville K2	139	151			157	164	7.00									7.55
Buffalo W6																6.90
Chicago, Ill. N4	137	150			156	163	6.90									7.475
Cleveland A5	142															
Crawfordsville M4	139	151			157	150	7.00									7.55
Danora, Pa. A5	137	149			155	162	6.90									7.45
Duluth A5	137	149	150	155	162	6.90										7.45
Fairfield, Ala. T2	137	149			155	162	6.90									7.45
Galveston D4	139															
Houston S2	142	154				164	7.15									7.70
Johnstown, Pa. B3	137	149				162	6.90									7.45
Juliet, Ill. A5	137	149			155	162	6.90									7.45
Kokomo, Ind. C9	139	149			157	161	7.00									7.55
Los Angeles B2							7.85									
Kansas City S2	142	150			167	164	7.15									7.90
Minneapolis C6	142	151	155	160		164	7.15									7.55
Monessen P6	137	151				163	6.90									7.45
Moline, Ill. R3			155													
Pittsburgh, Cal. C7	156	172			179	182	7.85									8.40
Portsmouth P7							7.90									
Randall, Pa. A5	137	149				162	6.90									7.45
So. Chicago R3	137	149	150			159	6.90									7.30
S. San Francisco C6						179										
Sparrows Pt. B3	139				157	164	7.00									7.55
Struthers, O. Y1							6.90									7.55
Worcester A5	143						7.20									
Williamport, Pa. S5			150													

Cut Nails, carloads, base \$8.38 per keg at Conshohocken, Pa. (A2). Galvanized products computed with zinc at 11.0¢ per lb. Exceptions: Alabama City and So. Chicago computed with zinc at 5¢; Chicago, zinc 12¢.

## C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.24-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgport, New Britain, Conn. N8	5.75	8.05	9.00	11.15	13.85
Buffalo, N. Y. R7	5.75	8.05	9.00	10.95	13.25
Carnegie, Pa. S9	5.75	8.05	9.00	11.15	13.85
Cleveland A5	5.75	8.05	9.00	11.15	13.85
Detroit D1	5.85	8.25	9.20	10.95	
Detroit D2	5.85	8.25	9.20		
Harrison, N. J. C11	5.85	8.35	9.30	11.45	14.15
Indianapolis C5	6.00	8.20	9.00	11.15	13.85
New Castle, Pa. B4	5.75	8.05	9.00	10.95	
New Haven, Conn. D1	6.20	8.35	9.30	11.25	
Pawtucket, R. I. N7	6.30	8.35	9.30	11.45	14.15
Riverville, Ill. A1	5.85	8.05	9.00	11.15	13.85
Sharon, Pa. S1	5.75	8.05	9.00	11.15	13.85
Trenton R4	6.35	8.35	9.30	11.25	13.90
Wallingford W1	6.20	8.35	9.30	11.45	14.15
Warren, Ohio T4	5.75	8.05	9.00	11.15	13.85
Wairton, W. Va. W3	5.85	8.05	9.00	10.95	13.25
Worcester, Mass. A5	6.60	8.35	9.30	11.45	14.15
Youngstown C5	5.85	8.05	9.00	11.15	13.85

## BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	28.33	33.97	27.48	32.95
	2 1/2	12	38.15	45.74	37.00	44.36
	3	12	44.05	52.82	42.72	51.23
	3 1/2	11	51.43	61.66	49.88	59.61
	4	10	60.29	71.88	58.64	70.42
National Tube	2	13	28.33	33.97	27.48	
	2 1/2	12	38.15	45.74	37.00	
	3	12	44.05	52.82	42.72	
	3 1/2	11	51.43	61.66	49.88	
	4	10	60.29	71.88	58.64	
Pittsburgh Steel	2	13	28.33	33.97		
	2 1/2	12	38.15	45.74		
	3	12	44.05	52.82		
	3 1/2	11	51.43	61.66		
	4	10	60.29	71.88		

## WARE-HOUSES

		Sheets			Strip		Plates		Shapes		Bars		Alloy Bars			
City	City Delivery Charge	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	As rolled A 4615	Hot-Rolled A 4140	Cold-Drawn A 4615	Cold-Drawn A 4140	Annealed	
Baltimore	20	6.62	7.51	7.79	6.69			6.37	6.72	6.68	8.82	12.94	12.54	15.34	15.19	
Birmingham	15	6.35	7.25	8.25	6.60	8.85	6.65	6.65	6.50	8.85						
Boston	10	6.50	8.10	9.00												
Butte	25	7.23	8.23	9.57	7.47	9.75	7.37	7.49	7.28	8.60	13.00	12.60	15.40	15.25		
Buffalo	25	6.35	7.40	8.75	6.70	7.92	6.65	6.70	6.50	7.40	12.70	12.15	15.16	14.80		
Chicago	20	6.38	7.38	8.30	6.62		6.52	6.69	6.51	7.25	12.25	12.05	14.60	14.70		
Cincinnati	20	6.49	7.37	8.25	6.86		6.81	6.91	6.75	7.55	12.55	12.35	14.90	15.00		
Cleveland	20	6.53	7.42	8.30	6.91		6.86		6.80							
Cleveland	20	6.38	7.38	8.25	6.72		6.69	7.02	6.57	7.35	11.96	12.11		14.76		
Denver		8.15	9.00	10.72	8.60		8.10	8.15	8.30	9.92				17.12		
Detroit	20	6.57	7.57	8.58	6.90		6.90	7.16	6.79	7.54	12.65	12.25	15.05	14.80		
Houston	20	7.35	7.90	9.93	7.70		7.35	7.60	7.70	9.30		13.25		14.90		
Kansas City	20	7.95	8.05	9.97	7.29		7.19	7.36	7.18	8.02	13.12	12.72	15.52	15.37		
Los Angeles	10	7.50	9.35	9.95	7.85		7.45	7.65	7.45	10.15		13.45		16.60		
Memphis	10	6.79	7.69		6.90		7.01	7.09	6.88	8.24						
Millwaukee	20	6.47	7.47	8.21	6.71		6.61	6.86	6.60	7.44	12.34	12.14	14.69	14.79		
New Orleans	15	6.70	7.65	9.23	6.80		6.80	7.05	6.80	8.60						
New York	10	6.97	7.79	8.79	7.36	10.15	7.07	7.13	7.30	8.63	12.63	12.43		15.08		
Niagara	20	7.07	8.56	8.89	7.86		7.27	7.38	7.37	8.33						
Niagara	20	7.00			7.10		7.10	7.10	7.10	8.60						
Philadelphia	10	6.19	8.00	8.34	7.04		6.59	6.64	6.64	7.86	12.61	12.36	15.06	14.91		
Pittsburgh	20	6.38	7.38	8.30	6.72		6.52	6.69	6.51	7.35	12.25	12.05	14.60	14.70		
Portland	20	7.00	7.75	8.90	7.25		6.85	7.00	7.05	10.20						
Salt Lake City	20	7.45	10.20	10.70	9.05		7.70	7.70	8.80	10.95						
San Francisco	20	7.55	8.95	9.40	7.60		7.40	7.50	7.35	10.95		13.35		16.50		
Seattle	60	8.10	9.00	10.15	8.30		7.80	7.75	7.80	10.95		13.90		16.40		
St. Louis	20	6.63	7.67	8.54	6.91	8.13	6.81	7.09	6.80	7.64	12.54	12.34	14.84	14.99		
St. Paul	20	7.04	8.03	8.96	7.28		7.18	7.35	7.17	8.01		12.56		15.21		

# Miscellaneous Prices

(Effective May 10, 1955)

## TOOL STEEL

F.o.b. mill					
W	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.54
18	4	1	—	5	2.245
18	4	2	—	—	1.705
1.5	4	1.5	8	—	.90
6	4	2	6	—	1.29

High-carbon chromium ..... .73  
Oil hardened manganese ..... .405  
Special carbon ..... .37  
Extra carbon ..... .31  
Regular carbon ..... .26  
Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

## CAST IRON WATER PIPE

		Per Net Ton
6 to 24-in., del'd Chicago	\$111.50 to \$115.30	
6 to 24-in., del'd N. Y.	115.00 to 116.00	
6 to 24-in., Birmingham	98.00 to 102.50	
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	..\$129.50 to \$131.50	
Class "A" and gas pipe, 5¢ extra; 4-in. pipe is \$5 a ton above 6-in.		

## LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

		Gross Ton
Openhearth lump	.....	\$11.25
Old range, bessemer	.....	10.40
Old range, nonbessemer	.....	10.25
Mesabi, bessemer	.....	10.25
Mesabi, nonbessemer	.....	10.10
High phosphorus	.....	10.00

## COKE

		Net-Ton
Furnace, beehive (f.o.b. oven)	.....	\$12.75 to \$13.25
Foundry, beehive (f.o.b. oven)	.....	.....
Foundry, oven coke	.....	\$16.00 to \$17.50
Buffalo, del'd	.....	\$28.08
Chicago, f.o.b.	.....	24.50
Detroit, f.o.b.	.....	25.50
New England, del'd	.....	26.05
Seaboard, N. J., f.o.b.	.....	24.50
Philadelphia, f.o.b.	.....	24.00
Swedeland, Pa., f.o.b.	.....	24.00
Painesville, Ohio, f.o.b.	.....	25.50
Erie, Pa., f.o.b.	.....	25.00
Cleveland, del'd	.....	27.43
Cincinnati, del'd	.....	26.56
St. Paul, f.o.b.	.....	33.75
St. Louis, f.o.b.	.....	26.00
Birmingham, f.o.b.	.....	22.65
Lone Star, Tex., f.o.b.	.....	18.50

## ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	22.00	48	110	10.80
20	72	21.25	40	100, 110	9.50
18 to 16	72	21.50	35	110	9.50
14	72	22.00	30	110	9.50
12	72	22.25	24	72 to 84	9.50
8 to 10	60	22.75	20	90	9.50
7	60	23.00	17	72	9.50
6	60	25.00	14	72	10.25
4	60	28.00	10, 12	80	11.10
3	40	30.00	8	60	11.40
2 1/2	36	36.75			
2	24	47.75			

\* Prices shown cover carbon nipples.

## BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

### Machine and Carriage Bolts

	Discount	
	Less Case	C.
1/2 in. & smaller x 4 in. & shorter	2	22
1/2 in. & smaller x 6 in. & shorter	+3	18
9/16 in. & 5/8 in. x 6 in. & shorter	+4	17
3/4 in. & larger x 6 in. & shorter	+6	15
All diam. longer than 6 in.	+15	8
1/2 in. & smaller x 6 in. & shorter	+3	18
Lag, all diam. x 6 in. & shorter	6	25
Lag, all diam. longer than 6 in.	+2	19
Plow bolts	23	23

### Nuts, H.P., C.P., reg. & hvy.

	Discount, Base Case or Key	
	Discount	Case or Key
3/4" or smaller	55	64
3/4" to 1 1/4" inclusive	58	66
1 1/4" to 1 3/4" inclusive	60	67 1/2

### C.P. Hex. regular & hvy

All sizes	55	64
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### Hot Galv Nuts (all types)

3/4" or smaller	38	50
3/4" to 1 1/4" inclusive	41	52 1/2

### Finished, Semi-finished, Slotted or Castellated Nuts

All sizes	55	66
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### Rivets

		Base per 100 lb
1/2 in. & larger	.....	\$9.25
7/16 in. and smaller	.....	Pot Off List 87

### Cap Screws

	Discount	
	H.C. Heat Bright	Treated
New std. hex head, pack-aged		
3/4" x 6" and smaller and shorter	38	28
3/4" x 1", 1" x 6" and shorter	15	1
New std. hex head, bulk*		
5" x 6" and smaller and shorter	50	42
3/4" x 1", 1" x 6" and shorter	32	21
*Minimum quantity per item:		
15,000 pieces 1/4", 5/16", 3/8" diam.		
5,000 pieces 7/16", 1/2", 5/8", 3/4" diam.		
2,000 pieces 3/4", 1", 1 1/4" diam.		

### Machine Screws & Stove Bolts

	Discount	
	Mach. Screws	Stove Bolts
Packaged, package list	22	43
Bulk, bulk list		
1/4 in. diam.	15,000-99,999	17 59
& under	100,000-199,999	25 63
5/16 in. diam.	200,000 & over	33 67
& larger	15,000-49,999	17 59
All diam.	50,000-99,999	25 63
over 3 in.	100,000 & over	33 67
long	50,000-99,999	59
	100,000 & over	63

### Machine Screw & Stove Bolt Nuts

	Discount	
	Hex	Square
Packaged, package list	30	33
Bulk, bulk list		
1/4 in. diam. & smaller	15,000-99,999	15 17
	100,000-199,999	23 25
	200,000 & over	31 33

## REFRACTORIES

### Fire Clay Brick

		Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00)	..\$114.00	
No. 1 Ohio	.....	107.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	.....	107.00
No. 2 Ohio	.....	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	.....	17.00

### Silica Brick

Mt. Union, Pa., Ensley, Ala.	.....	\$120.00
Childs, Hays, Pa.	.....	125.00
Chicago District	.....	130.00
Western Utah	.....	.....
California	.....	.....
Super Duty	.....	.....
Hays, Pa., Athens, Tex., Windham	.....	137.00
Curtner, Calif.	.....	155.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	.....	20.00
Silica cement, net ton, bulk, Hays, Pa.	.....	22.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	.....	21.00
Silica cement, net ton, bulk, Utah and Calif.	.....	.....

### Chrome Brick

		Per net ton
Standard chemically bonded, Balt.	.....	\$86.00
Standards chemically bonded, Curtner, Calif.	.....	96.25
Burned, Balt.	.....	80.00

### Magnesite Brick

Standard Baltimore	.....	\$109.00
Chemically bonded, Baltimore	.....	97.50

### Grain Magnesite

		St. % in., grains
Domestic, f.o.b. Baltimore	.....	.....
in bulk fines removed	.....	\$64.40
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	.....	.....
in bulk	.....	38.00
in sacks	.....	43.75

### Dead Burned Dolomite

		Per net ton
F.o.b. bulk, producing points in: Pa., W. Va., Ohio	.....	\$14.50
Midwest	.....	15.10
Missouri Valley	.....	12.65

## FLUORSPAR

Washed gravel, f.o.b. Rosiclare, Ill.	.....	.....
Price, net ton; effective CaF <sub>2</sub> content.	.....	.....
72 1/4%	.....	\$44.00
70% or more	.....	42.50
60% or less	.....	38.00

## METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f.	.....	11.25¢
New York, ocean bags	.....	.....
Canadian sponge iron, Del'd in East	.....	13.0¢
F.o.b. ship, pt., carloads	.....	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	.....	9.5¢
Electrolytic iron, annealed, 99.5+% Fe	.....	38.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	.....	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	.....	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe	.....	\$3.0¢ to \$1.48
Aluminum	.....	31.5¢
Brass, 10 ton lots	.....	\$9.50¢ to \$6.50¢
Copper, electrolytic	.....	\$1.50¢
Copper, reduced	.....	\$1.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	.....	.....
Chromium, electrolytic, 99% min., and quality, del'd	.....	\$3.60
Lead	.....	\$3.50¢
Manganese	.....	\$7.0¢
Molybdenum, 99%	.....	\$2.75
Nickel, unannealed	.....	\$5.50¢
Nickel, annealed	.....	\$6.50¢
Nickel, spherical, unannealed	.....	\$3.50¢
Silicon	.....	\$3.50¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	.....	.....
Stainless steel, 202	.....	91.0¢
Stainless steel, 316	.....	\$1.10
Tin	.....	14.0¢ plus metal value
Tungsten, 99% (65 mesh)	.....	\$4.05
Zinc, 10 ton lots	.....	\$17.5¢ to \$25.0¢



# Ferroalloy Prices

(Effective May 10, 1955)

## Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 3% max Si.  
 0.025% C ... 36.00 0.15% C ... 33.75  
 0.025% C ... 36.00 0.20% C ... 33.50  
 Simplex ... 34.50 0.40% C ... 33.25  
 0.06% C ... 34.50 1.00% C ... 33.00  
 0.10% C ... 34.00 2.00% C ... 32.75  
 65-69% Cr, 4-9% C ... 24.75  
 62-66% Cr, 4-6% C, 6.9% Si ... 35.60

## S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.  
 High carbon type: 60.55% Cr, 4-6% Si, 4-6% Mn, 4-6% C.  
 Carloads ... 25.85  
 Ton lots ... 28.00  
 Less ton lots ... 29.50

## High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add \$4 per lb to regular low carbon ferrochrome price schedule. Add \$4 for each additional 0.25% of N.

## Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.  
 0.10% max. C ... \$1.18  
 0.50% max. C ... 1.14  
 9 to 11% C ... 1.25

## Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-48%, C 0.05% max.)  
 Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 34.75¢ per lb contained Cr plus 13.00¢ per lb contained Si. Bulk 3-in. x down, 35.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

## Calcium-Silicon

Contract price per lb of alloy, lump, delivered.  
 30-35% Cr, 60-65% Si, 3.00 max. Fe.  
 Carloads ... 19.00  
 Ton lots ... 22.10  
 Less ton lots ... 23.60

## Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.  
 15-20% Ca, 14-18% Mn, 53-59% Si.  
 Carloads ... 20.00  
 Ton lots ... 22.30  
 Less ton lots ... 23.30

## SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.  
 Ton lots ... 17.50  
 Less ton lots ... 19.50

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.  
 Carload lots ... 16.60  
 Ton lots ... 18.10  
 Less ton lots ... 19.35

## Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.  
 Carload packed ... 17.50  
 Ton lots to carload packed ... 18.50  
 Less ton lots ... 20.00

## Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point  
 Marietta, Ashabula, O.; alloy.  
 W. Va.; Sheffield, Ala.; Portland, Ore.  
 Clairton, Pa. ... 9.50  
 Sheridan, Pa. ... 9.50  
 Philo, Ohio ... 9.50  
 Add or subtract 0.1¢ for each 1 pct Mn above or below base content.  
 Briquets, delivered, 6¢ per Mn:  
 Carloads, bulk ... 11.85  
 Ton lots packed ... 12.65

## Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.  
 Manganese Silicon  
 16 to 19% 2% max. ... \$24.00  
 19 to 21% 3% max. ... 26.00  
 21 to 23% 3% max. ... 28.50  
 23 to 25% 3% max. ... 31.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.  
 95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.  
 Carload, packed ... 45.00  
 Ton lots ... 43.50

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.  
 Carloads ... 30.00  
 Ton lots ... 32.00  
 250 to 1999 lb ... 24.00  
 Premium for hydrogen-removed metal ... 0.75

## Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.35 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ... 21.35¢

## Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.  

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	22.00	32.85	35.05
0.07% max. C	20.95	31.80	33.80
0.15% max. C	20.45	30.30	31.50
0.30% max. C	20.95	28.80	30.00
0.50% max. C	20.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

## Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mo, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.  
 Carload bulk ... 11.00  
 Ton lots ... 12.65  
 Briquet contract basis carlots, bulk, delivered, per lb of briquet ... 12.45  
 Ton lots, packed ... 14.25

## Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$85.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$88.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.46 for each 0.50% Mn over 1%.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.  

	Ton lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

## Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.  
 Carloads, bulk ... 6.55  
 Ton lots ... 8.35

## Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.  

25% Si	20.00	75% Si	14.40
50% Si	12.00	85% Si	16.10
65% Si	13.50	90% Si	17.25

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.  

	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

## Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.  
 Openhearth ... \$2.00-\$2.10  
 Crucible ... 3.10-3.20  
 High speed steel (Primox) ... 3.30-3.35

Alsilfer, 20% Al, 40% Si, 40% Fe. Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ... 9.25¢  
 Ton lots ... 10.15

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo ... \$1.25

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.  
 Ton lots ... \$12.00  
 Less ton lots ... 12.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta ... \$6.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo ... \$1.46

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton ... \$90.00  
 10 tons to less carload ... \$110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.50  
 Less ton lots ... \$1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ... \$177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. ... \$3.80

Molybde oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. ... \$1.27  
 bags, f.o.b. Washington, Pa. Langeloth, Pa. ... \$1.24

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. Carload, bulk, lump ... 16.50¢  
 Ton lots, packed lump ... 16.75¢  
 Less ton lots, lump, packed ... 17.35¢

Vanadium Pentoxide, 86 - 89% V<sub>2</sub>O<sub>5</sub> contract basis, per pound contained V<sub>2</sub>O<sub>5</sub> ... \$128

Zirconium, contract basis, per lb of alloy.  
 35-40%, f.o.b. freight allowed, ton lots ... 26.00¢  
 12-15% del'd, lump, bulk-carloads ... 8.00¢

## Boron Agents

Borasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3.14%, Si, 40-45%, per lb contained B ... \$5.25

Borham, f.o.b. Niagara Falls  
 Ton lots, per pound ... 45¢  
 Less ton lots, per pound ... 50¢

Corborham, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.  
 Ton lots per pound ... 10.00¢

Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots ... \$1.20  
 F.o.b. Wash., Pa.; 100 lb up  
 10 to 14% B ... .85  
 14 to 19% B ... 1.20  
 19% min. B ... 1.50

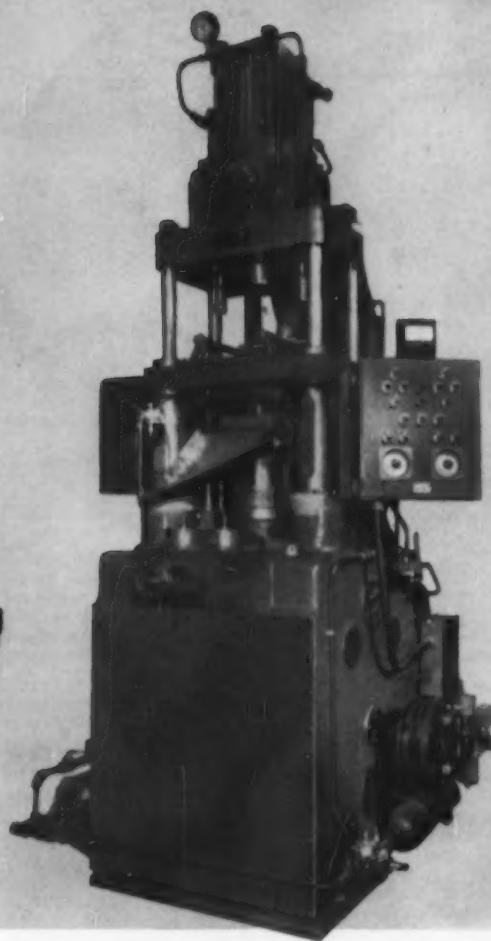
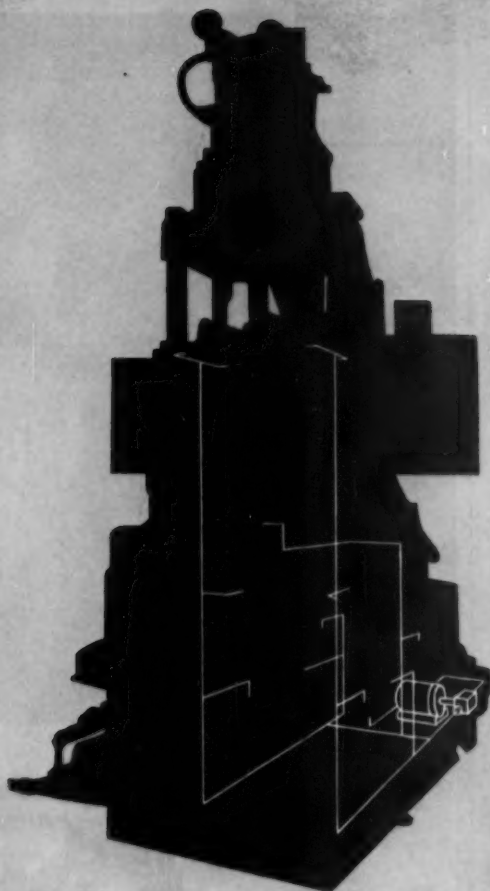
Grinal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over  
 No. 1 ... \$1.00  
 No. 6 ... 62¢  
 No. 79 ... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.  
 Ton lots ... \$1.46  
 Less ton lots ... 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd, less ton lots ... \$2.05

Silases, contract basis, delivered.  
 Ton lots ... 45.00¢





Model L

## AUTOMATIC LUBRICATION protects new Baldwin powdered metal presses

Baldwin Model "L" and "C" powdered metal presses are just what you need for highest-quality and lowest-cost production. That's true because these new 50 and 100 ton presses are the first designed specifically for compacting metal powders.

A big reason why you'll get such low cost production is their automatic lubrication. In both presses a gear type oil pump, independently driven by a fractional horsepower motor, automatically lubricates all moving parts continuously. It forces filtered oil through a drilled crankshaft to the crank and connecting rod bearings. It pressure lubricates all other bearings subject to load.

Baldwin Model "L" and "C" presses are designed so that all moving parts are completely enclosed and sealed.

Abrasive powder and dirt can't get into the bearings. These presses automatically fail to operate unless there is oil pressure in the lubricating system. An easily serviced oil filter provides further protection.

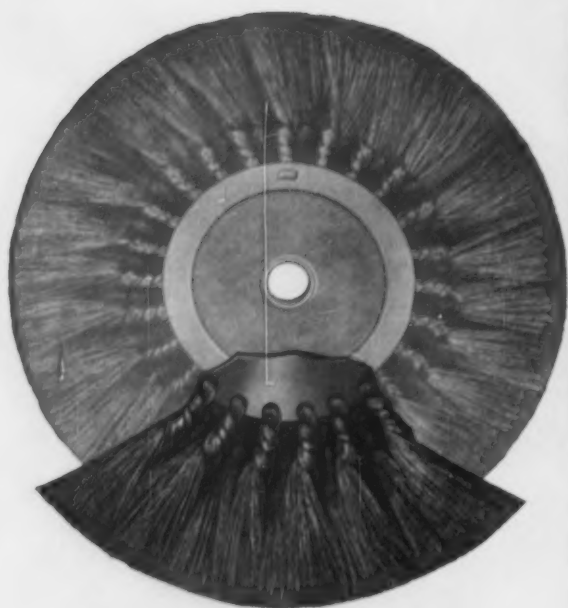
No other powdered metal presses have been designed just to meet your end product's needs. That's why Baldwin's new presses are your best buy. Only they can give you such uniform compacts and so little press maintenance because they both have automatic lubrication, hydraulic heads, shuttle type feeders, sealed mechanism, simple fill adjustments and variable cycling.

For more details about "L" and "C" please write to our Dept. 3816, Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa.



EDDYSTONE DIVISION

**BALDWIN-LIMA-HAMILTON**



## How Pittsburgh knotted brush construction provides

- Better Balance • Uniform wear
- Better cleaning
- Longer equipment life

Because of their construction, Pittsburgh "Lightning" knotted sections have *exactly the same number of wires in every knot*. As a result, you get a brush with perfect balance—one that will wear uniformly and cause less bearing—destroying vibration in the machine that drives it!

What's more, the special type of wire used in these knots is the fastest cutting, with the longest life, that can be produced. Built for the toughest applications, "Lightning" brushes are perfect for cleaning welds, removing scale or rubber, or cleaning parts where penetration brushing is needed.

This is just one example of superior Pittsburgh construction, engineered for both general and specific applications. For details of the complete line, write for free Catalog No. 54-W. Address: PITTSBURGH PLATE GLASS CO., Brush Division, Dept. N-5, 3221 Frederick Ave., Baltimore 29, Maryland.



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The new V-type sealed ends on UDD Copper Tubing are just one of many superior factors which have made this product a leading industrial choice in production operations all across the country. UDD Copper Tubing comes packed in drums with sizes plainly marked for easy use. Ask for New UDD Copper Tubing Folder.



**UDD V-Type Sealed End**  
Assuring  
Moisture Free,  
Clean, Bright Surface

**Try The United Brand  
of Rapid,  
Dependable Mill Service!**



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# TO GET MORE SIZES OUT OF A WAREHOUSE THAN YOU PUT IN...

## Use These Waterbury Farrel "Experts"

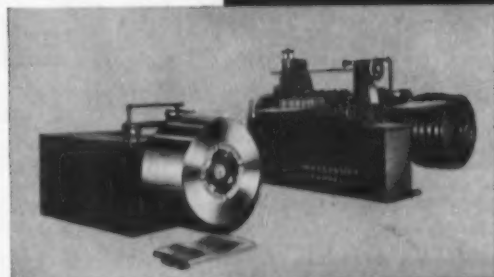
- Available In Sizes To Fit Your Requirements
- Engineered For Efficient Low Maintenance Operation

These WF units make your strip metal warehouse a streamlined production unit... able to produce specified sizes on the spot, from mill coils. You minimize storage space and inventory... step up deliveries... cut initial costs on shipping and packing... meet and beat competition.

Embodied in each piece of WF warehouse equipment is the up-to-date design and sound engineering which have built Waterbury Farrel's reputation in metal-working machinery since 1851.

*Write for further details on any of the units shown or mentioned here.*

Eleven Roll Straightener. 17½" diameter x 14" face rolls. Upper rolls individually adjustable. Straighteners are available in a range of sizes with roll diameters and widths to meet varying requirements.



Gang slitting line consisting of payoff stand, coil lift, slitter and winder—built in various sizes to handle a wide range of gauges and widths.

Gang slitting machine arranged for slitting sheet stock—also available in several sizes.



Portable Roll Feed Straightener With Detachable Coil Box. Has variable speed drive and feed rolls on the front side. Nine 1½" x 7" rolls. Other sizes available.

18" Motor-driven Cut off Saw for rods and tubes. Fully enclosed, including hinged saw guard.



WF-16



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POWER PRESSES — Crank, Cam and Toggle, also Rack and Pinion Presses • Eyelet Machines • Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc. MILL MACHINERY — Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. WIRE MILL EQUIPMENT — Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers • Swagers • Bull Blocks • String-up Machines • Spoolers, etc. COLD PROCESS BOLT & NUT MACHINERY — Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc.

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All cars in this series are being released due to a change of operations—not because of age or condition. They are now in interchange service and have been maintained in excellent condition. They are ready for immediate service.

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## DIE CUSHIONS FOR ALL TYPE POWER PRESSES

PNEUMATIC & HYDROPNEUMATIC...  
WITH OR WITHOUT LOCKING DEVICES



### NEW PATENTED CL TYPE PNEUMATIC DIE CUSHION WITH INTEGRAL HYDRAULIC LOCKING DEVICE

- ★ BUILT MORE COMPACTLY FOR SMALL SPACES
- ★ FEWER PARTS
- ★ COMPLETELY SELF CONTAINED
- ★ LOWER INITIAL COST
- ★ LESS MAINTENANCE COST

With the standard type locking device mounted below a pneumatic cushion, it is necessary to mount the press over a pit because the over-all height of a standard type cushion is too great. Usually this compact Baker Cushion requires *no pit*. The cushion is mounted in the press through the bed opening with minimum loss of time and production. For full information write

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## MUNDT PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can perforate almost any size perforation in any kind of metal or material required. Send us your specifications.

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TIN, STEEL, COPPER, ALUMINUM, BRONZE,  
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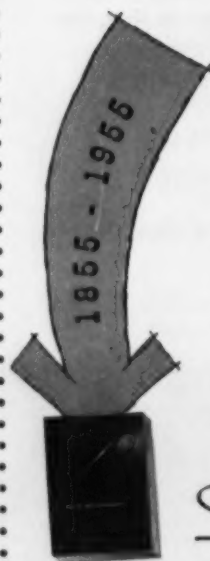
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## and in the next 100 years...

What is the future of metalworking? How does the past foretell the great things to come for America's greatest industry?

That's the subject of the most comprehensive issue ever to be published by *The Iron Age*—"100 Years of Metalworking," commemorating *The Iron Age's* 100 years of service to the metalworking industry.

You'll find fourteen sections, covering every phase of metalworking. You'll be treated to a review of the past, a discussion of the present and *The Iron Age's* predictions for the future in each section. You'll want this issue for your permanent files. Watch for it!



*The Iron Age*





The greatest improvement in chain  
since the invention of electric welding!

ACCO's Great  
New Chain...

ACCOLOY  
**X-WELD**  
125

• *At last*—a chain with welds as strong or stronger than the material . . . welds that won't break when links are bent sharply . . . welds made with two projecting lugs that absolutely prevent dangerous kinking of the chain . . . welds that provide  $2\frac{1}{4}$  times the welded area found in normal flash or butt-welded links. **Accoloy X-Weld 125** Chains hang straight as a die. This newest method of chain welding assures that every link is perfectly formed. These are some of the benefits enjoyed by users of this great new chain.

**Accoloy X-Weld 125** Chain has almost countless uses: Slings, bundling, elevator, traction, towing, general utility chains . . . It can be furnished in special analyses and heat treatments to provide greatly extended life and use on tough jobs . . . corrosive jobs . . . abrasive jobs . . . hot jobs. If you specify **Accoloy X-Weld 125** for your next chain job, you'll gain a new concept of chain performance, economy and value. Available in  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{5}{8}$ " and  $\frac{3}{4}$ " sizes.

Ask our nearest district office for further information  
on **ACCOLOY X-WELD 125** Chain, or write the *American  
Chain Division, York, Pa., for descriptive bulletin*

**Check these features:**

- ✓ In hundreds of destruction tests . . . straight pull and bending . . . **Accoloy X-Weld 125** Chain has never broken at the weld
- ✓ Welded area  $2\frac{1}{4}$  times area in usual butt or flash welding
- ✓ Every X-Welded link is perfectly formed . . . chain always hangs straight as a die
- ✓ X-Weld Lugs are designed to positively prevent chain kinking
- ✓ Special analyses and heat treatments available for tougher jobs
- ✓ Maximum strength-size ratio
- ✓ Field tested and proved under severe service conditions
- ✓ Will withstand normal elongation under standard test procedures

The Secret is  
in the Weld!



This **Accoloy X-Weld 125** link was ground and etched to show its big welded area —  $2\frac{1}{4}$  times the size of welded area possible with other welding processes. This means more than double the security at the weld — and only X-Weld has it!

**ACCO**



**American Chain Division  
AMERICAN CHAIN & CABLE**

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or STEEL"**

## THE CLEARING HOUSE

### News of Used and Rebuilt Machinery

**Cleveland Converts . . .** A little ingenuity still goes a long way in coaxing a good living from used machinery. Living testimony is Creative Metal Products Co., Cleveland and its president, Martin Speigel.

Creative takes specialized, high speed machine tools, principally from Detroit and government surplus sales, and converts them to general use.

Thus a Foote-Burt 4-spindle No. 5 Morse taper drill press has been rebuilt with a new chain of gears for slower feeds and speeds in close-tolerance drilling on large bores. Two drill presses have been changed to feed in reverse and ream a tapered hole.

A screw operated straightening press, designed for straightening axles, now bends clevises on a high production basis.

A Baker inverted 2-spindle drill press, obtained at a government surplus sale, worked for the government again on development projects at a savings of more than 80 pct over previous methods. Unit

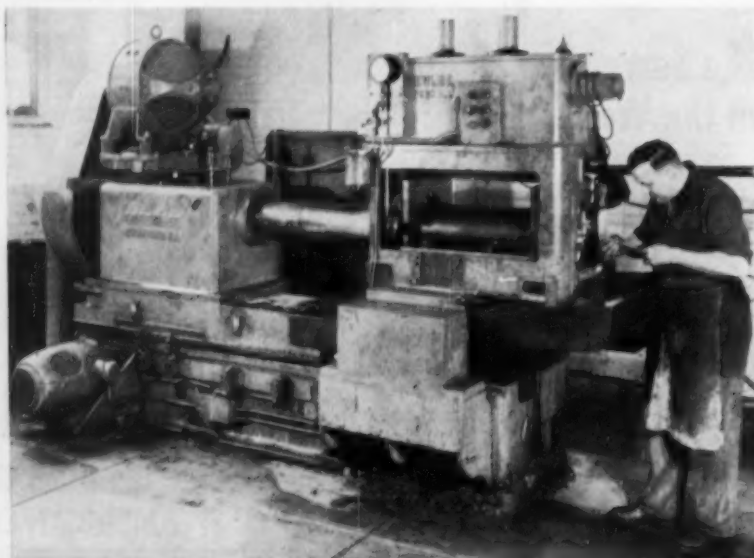
now handles various general jobs.

An automatic 4-spindle Baker horizontal drill—one of the only four made in the U. S.—was originally used for machining bomb parts in a World War II arsenal. Now, with its indexing head, it can be applied to any four-step drilling, facing, or tapping operation.

**Holds Close Tolerances . . .** A Snyder double end boring machine, which takes pieces up to 100 in. long and 20 in. diam bore, will hold unusually close tolerances.

All this and more is strictly a post war development. Mr. Speigel arrived in this country in 1940, fresh from the Skoda works in Czechoslovakia. He served 5 years in the U. S. Army, worked a while on the outside, then put earnings and a G. I. loan into a 30 year old lathe and three drill presses.

Creative now has 40 machines and 28 full time employees. Company can handle all contract shop sizes of machining, drilling, tapping, turning, milling, assembling and general fabricating jobs.



**NEW LOOK:** Machinist at Creative Metal Products Co., Cleveland, gages bore produced with a Greenlee horizontal boring mill.

# THE CLEARING HOUSE

## CONSIDER GOOD USED EQUIPMENT FIRST

### AIR COMPRESSOR

2250 cu. ft. Ingersoll Rand PRE-2 30 1/2"x15"x19"  
150# Pressure, Complete with Steel Equip., Air  
Receiver, etc. NEW 1953

### ANGLE BENDING ROLL

4 x 4 x 1/2" Bertch Angle Bending Roll, M. D.

### BENDING ROLLS

8' x 1/2" Bertch Initial Type  
8' x 1/2" Webb 9L-2 Initial Type  
10' x 1/2" Bertch Initial Type  
12' x 1/2" Hillis & Jones Pyramid Type  
12' x 1/2" Niles-Bement-Pond Pyramid Type  
14' x 1/2" Williams & White Pyramid Type  
10' x 1/2" Bertch Initial Type Bending Roll  
20' x 1/2" Hillis & Jones Pyramid Type Bending Roll

### BRACKS-LEAF TYPE

8' x 1/2" Dreis & Krump Size 186  
12' x 1/2" Dreis & Krump, Motor Driven

### BRACKS-PRESS TYPE

12' All Steel Press Brack, 250 ton Capacity  
Cincinnati All Steel Press Brack 10' x 1/2"

### CRANES-OVERHEAD ELECTRIC TRAVELING

5 ton P&H Trav-Lift 30' Span 220/440 A.C.  
5 ton P&H Trav-Lift 38' Span 440 Volt A.C.  
5 ton Northern 35' Span 220/3/60 A.C.  
5 ton Toledo 60' Span 220 Volt D.C.  
5 ton Cleveland 90' Span 220 Volt D.C.  
7 1/2 ton Shepard-Niles 23' Span 220/3/60 A.C.  
10 ton P&H 35' Span 220 Volt D.C.  
10 ton Shaw 75' Span 220 Volt D.C.  
10 ton OET 45' Span 220/3/60 A.C.  
15 ton Shaw 75' Span 220 Volt D.C.  
25 ton P&H 60' Span 220 Volt D.C.  
With 5 ton Auxiliary  
30 ton Whiting 60' Span 220 Volt D.C.  
50 ton Niles 60' Span 220/3/60 A.C.  
125 ton Cleveland 65' Span 220 Volt D.C.  
With 5 Tontrails 83 1/2 ton & 10 ton Aux.

### DIEING MACHINE

35 ton Henry & Wright, 1 1/2" Stroke, Double Roll  
Feed, Iron Shear

### DRAW BENCHES

30,000# Standard Double Draw, 48" Length of Draw  
35,000# McKay Draw Bench, 41" Length of Draw  
100,000# Pools Draw Bench, 39" Length of Draw  
100,000# Aetna Standard, 50" Length of Draw

### FORGING MACHINES

1" 1 1/4" x 3 1/4" Acme  
1" 3 1/4" x 3" x 3 1/4" 4", 5" Ajax  
3" National  
7 1/2" National-Air Clutch

### FURNACE-MELTING

3 ton Whiting Hydro Arc, Top Charge

### HAMMERS-BOARD DROP

2000 lb. Chambersburg Model J, Motor Driven  
4000 lb. Chambersburg Model F  
4000 & 5000 lb. Erie

### HAMMERS-BOARD DROP-STEAM DROP-STEAM FORGING-800 lb. to 20,000 lb.

### LEVELERS-ROLLER

48" McKay 12 Rolls 4 1/4" Diameter  
52" Aetna Standard 17 Rolls 2 1/2" Dia.  
52" McKay 17 Rolls 4" Dia.  
54" Aetna Standard 17 Rolls 4 1/4" Dia.  
60" Aetna Standard 17 Rolls 4 1/4" Dia.  
72" McKay 15 Rolls 4 1/4" Dia.  
76" Voss-Ungerer, 23 Work Rolls 2.105" Dia. Ca-  
pacity 22 to 15 Gauge Mild Steel

### PLATE EDGE PLANERS

35 ft. Southwark, Capacity 1 1/2"  
25 ft. Hillis & Jones, Capacity 1 1/4" Plate

### PRESSES-HYDRAULIC

500 ton Wood 4-Columns, 24" Stroke, 73" x 96"  
Between Columns  
1200 ton Birdsboro 4-Columns, 20" Stroke 90" x 96"  
Between Columns

### PRESSES-INCLINABLE

20 1/2" Niagara, 150 ton, 18" Stroke  
Cleveland, 125 ton, 13" Stroke

### PRESSES-STRAIGHT SIDE

#304 Hiles, 8" Stroke  
#308 Hiles, 255 ton, 14" Stroke  
#308 Hiles, 200 ton, 18" Stroke, Bed Area 108"x60"

### PRESS-TOGGLE

750 ton Bliss-Toledo Model 181-8 Toggle Action Press,  
42" Ram Stroke, 25" Blankholder Stroke, Bed  
Area 150" x 60", P&H 60" Elec. Equip.

### PUNCH & SHEAR COMBINATIONS

Style EF Cleveland, 56" Throat, Punch 1 1/2" thru 1"  
No. 3 1/2 Buffalo Universal Ironworker  
No. 1 Long & Allistatter Double End, Capacity Punch  
1 1/2" thru 1", Shear 2" Bd, 95 1/2" Angles  
Style W Cleveland Single End, 60" Throat, 819 Ton  
With Attachment for Dishing Heads

### ROLLING MILLS

7 1/2" Nickel Four High Rolling Mill  
4 x 12" Blake & Johnson Single Stand Two High  
10" x 14" United Three Stand Two High  
12" x 18" Waterbury Parrel Temper Mill  
14" x 30" Parrel Birmingham  
16" x 30" Waterbury Parrel Single Stand 2-High  
16" x 20" Lewis Two High Two Stand

### 20" x 36" Pools Two Stand Two High

25" x 58" Three High Breakdown Mill

### ROLLS-PLATE STRAIGHTENING

51" Bertch, 7 Rolls 10" Diameter  
52" Bertch, 7 Rolls 10" Diameter

### SHEARS-GATE

48" x 1 1/4" Mackintosh-Hemphill  
52" x 1 1/4" Pels  
60" x 1 1/4" Birdsboro

### SHEARS-ANGLE

50x1" Long & Allistatter Size B  
50x1" Long & Allistatter Size C

### SHEAR-BAR

#9 Buffalo Bar Cutter, Capacity 3" sq. 3 1/4" Rd.  
#9 Buffalo Bar Cutter, Capacity 3" sq. 3 1/4" Rd.

### SHEAR-BEAM

Pels DT-36-B Beam Shear, Capacity 3" to 18" I-  
beams 60x6" Angles, Belted Motor Drive

### SHEAR-GUILLOTINE

#3 Hiles & Jones, Capacity 4 1/4" Round, 4" Square

### SHEARS-ROTARY

3/16" Quickwork Rotary Shear, 36" Throat  
3/16" Kline #258, With Flanging Attachment  
3/16" Quickwork Whiting #48A-NEW 1953

### SHEARS-SQUARING

10" x 1/2" Cincinnati-LATH  
12" x 1/2" American  
150" x 1/2" Birdsboro

### SPLITTERS

36" Yoder Splitting Line with Coilers  
38" Passon Coil & Sheet Splitter  
72" Yoder Sheet Splitter

### STRAIGHTENERS

No. 0 Medart Continuous Automatic Straightening  
Machine, Capacity 3/4" to 1 1/2" Dia. Bars any  
length or up to 2" Tubing, Motor Driven

### TESTING MACHINES

5,000 lb. Olson Hydraulic LeCap Universal  
2,000 lb. Hiehle Model PB-3 Universal  
10,000 lb. Tinius Olsen Universal  
30,000 lb. Tinius Olsen Universal  
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No. 488V Quickwork Whiting Stamping Trimmer  
300 KVA Progressive Univ. Beam Welder, 220 v. 60 cy.

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300 KVA Progressive Univ. Beam Welder, 220 v. 60 cy.  
WELDING POSITIONER  
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### BORING MACHINES

30" & 42" Bullard vertical turret lathes  
No. 2 P. & W. Jig Borer, Model 1278.  
3" Bar Yoder, lathe type, 1942.

### DRILLING MACHINES

4' arm 12" col. Carlton radial, P.F., P.E.  
9' arm 18" col. American radial, H.D.  
4' arm 13" col. Foodick Hyd., new 1941.

### GRINDING MACHINES

10" x 120" Landis gap type cyl. grinder, hyd.  
40" No. 16A2 Blanchard 2-sp. rotary, new 1948.  
72" Hanchett 3-sp. rotary surface, new 1948.  
6" x 18" Landis cyl. 30 deg. & Head, 1941.  
16" x 90" Landis gap type cylindrical, new 1941.

### LATHES

No. 5 Jones & Lamson ram type univ. turret (2) lathes.  
14" x 6" Hendey Toolroom, 1940.  
12" x 30" Monarch Model C, new 1942.  
15" x 30" Lipe Carbo-Matic, 1942.  
8" x 18" Hendey Pres., Tool & Gauge, 1940.

### MILLS

1-18 Cincinnati production.  
No. 2 Kearney & Trecker plain.  
1-2-3-4-5-6 knee type plain & vertical.  
No. 3B Brown & Sharpe, pl. horiz., 1942.  
42" x 42" x 19" Ingersoll adj. planer type.  
60" x 48" x 16" Ingersoll adj. rail planer type.  
No. 2H K & T plain horiz., new 1942.

### PRESSES

100 ton No. 90C Toledo S.S., D.C., cushions.  
100 ton No. 13-1 Cleveland OBI, lathe type.  
300 ton No. 1010 Hamilton D.C., adj. bed, 60" x 102".  
400 ton No. 663 Toledo K-J coining or embossing.  
500 ton Baldwin Southwark HYPERDIE Press.  
545 ton No. H36125 Hamilton Forging Press.  
1000 ton No. 685 Toledo coining or forging.  
800 ton Minter K-J Coining, 1941.

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24" G & E Hi-Duty universal  
32" G & E Invariable, F.W.D., lathe type.

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1 1/2" Natl. susp. slides, auto-lub. guided ram.  
3 1/2" Ajax, suspended slides, steel frame.  
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3 phase-60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1500	G.E.	MT-498	2300	360
1	1500	ABB		2300	720
2	1000	A.C.	MIII	2300	240
1	800	G.E.	MT	2300	360
1	700	A.C.		2300	500
1	500	G.E.	M-574Y	6000	900
1	500	G.E.	MT-412	2300	500
1	500	Whar.	CW	550	150
1	400	Whar.	CW-960A	440	1170
1	400	Whar.	CW	440	514
1	400	Whar.	CW-1213	2300	435
1	350	G.E.	MT-445Y	2300/4000	255
2	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	MT-555B	2300	1300
1	250	Al. Ch.		550	600
1	200	Cy. Wh.	26QB	440	505
1	200	G.E.	IM	440	435
1	150 (unused)	Whar.	CW	2800	435
2	125	A.C.		440	865
1	125	Al. Ch.		440	720
1	100	G.E.	IM-16	2300	435
1	100	G.E.		440	600
4	100	A.C.	ANY	440	695

### SQUIRREL CAGE

2	650	G.E.	PT-555BY	440	3570
1	500	G.E.	K-145-B	2300	1180
2	450	Whar.	CW-1420	2300/4150	374
1	400	G.E.	TE-15B	2300	1165
1	400	G.E.	IK	2300	500
1	200	G.E.	IK-17	440	600
3	200	G.E.	KP-557	440	1800
1	150/75	G.E.	IK	440/900/450	
1	150	Whar.	CW-856R	440	840
1	150	Whar.	CW	440	600
2	125	Al. Ch.	ARW	2200	1750
1	100	Whar.	CW-876C-TEFC	440	710

### SYNCHRONOUS

1	4250	C.W.	3501-RL	13800/6000	514
2	2100	G.E.	ATI	2300	360
2	2000	Whar.		2300	120
2	1750	G.E.	ATI	2300	360
1	725	G.E.	ATI	2200/12000	600
1	500	Idem	RM	2300/4160	1000
2	500	G.E.	TM-756T	2300	1200
1	450	Whar.		2300	125
1	450	Whar.		2300	450
1	400	G.E.	TM-758G	2300	1200
1	400	G.E.	TM	2300	400

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Shears, 6" Stroke, Capacity 75 Ton.

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Plate Shear, Long and Allistatter, capacity  
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1", 1 1/2", 2", 3", 4".

Upsetting and Forging Machines, Not Suspended  
Slides, 1/2", 1", 1 1/2", 2", 2 1/2", 3".

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Landis Landmac Threading machines with lead  
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two spindle 1", two spindle 1 1/2".

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No. 2F Foster Fastermatic, m.d., Timken  
No. 2G Morey, 1" cap., bar  
No. 2L Gisholt Universal, m.d., latest type  
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No. 3 Warner & Swasey, m.d.  
No. 3 Foster Geared Head, m.d.  
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No. 4 Warner & Swasey, cone, bar and chucking types  
No. 4A Warner & Swasey Universal, m.d., chucking  
No. 4 Warner & Swasey, preslector head, m.d.  
No. 4 Gisholt Universal, m.d.  
No. 4L Gisholt Universal, m.d.  
No. 4FU Foster Fastermatic, m.d., latest  
No. 5 Gisholt Ram Type, preslector head  
No. 5 Gisholt Universal, m.d., late type  
No. 5 Warner & Swasey, m.d.  
1/2" Pratt & Whitney Hand Screw Machine, cone, bar  
2 1/2"x24", 3 1/2"x32", 4x34" Jones & Lamson Geared Head, m.d., bar and chucking  
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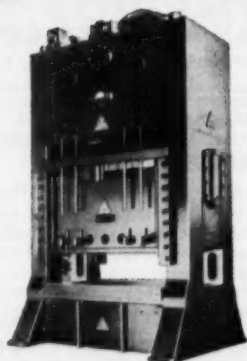
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1	1500	O.E.	514	250	13,200/6600
2	1200	Whase	720	600	2300
1	1000	O.E.	900	250	2300
2	1000	Whase	514	600	11,200/6600
1	500	C.W.	720	575/600	2300/440
2	500	Whase	1300	125/250	2300
1	450	C.W.	720	250	2300/440
1	400	C.W.	1200	125/250	2300/440
3	200	O.E.	900	125/250	2300
1	200	Whase	1300	600	2300/440
1	150	O.E.	720	250	2300/440
1	100	Whase	900	250	2300
1	100	C.W.	1300	125	440/220
1	300	Whase	1300	250	4160

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Qu.	H.P.	Make	Type	Volts	R.P.M.
2*	3000	Whase	Encl.	525	600
1	2000	Whase	MIII	600	230/400
6	1500	Whase	Encl.	525	600
1	1200	O.E.	MCP-6	600	350/700
4	800	Whase	Encl.	525	600
1	800	Whase	MIII	300	250/350
5	700	Whase	Encl.	250	200/700
2	500	Whase	MIII	250	285/710
1	250	O.E.	CD-100-A	230	1150
1	250	O.E.	MPC	230	325/875
1	250	O.E.	MCP	600	300/885
1	200/250	El. Dy.	#23	230	400/1200
1	200	Whase	MIII	230	300/1200
1	200	O.E.	MCP-620	250	350/410
1	180	O.E.	MPC	250	400
1	150	Whase	RK-201	230	300/900
2	125	Whase	RK-184	230	575/850
1	125	Whase	RK-180	600	600
1	125	O.E.	MPC-6	230	400/600
1	90/100	O.E.	MPC	250	625/1125
4	100	El. Dy.	S-30	250	450/1350
3	75	C.W.	S-H	230	860
1	75	Cont.	D147X	230	425/1275
3	50	Whase	RK-131.5	230	600/2200
1	40	Whase	RK-140	230	500/1700
1	40	O.E.	CD-128	230	500/1600
1	35	Whase	RK	230	250/1600
1	32 1/2	Whase	RK-150	230	400/1200
3	25	Whase	RK-95	230	1300

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2", 4", 6", 8", 12" Landis Pipe Threaders,  
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18" Saunders Pipe Threader fitted with  
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2" two-spindle Landis Landmaco Pipe &  
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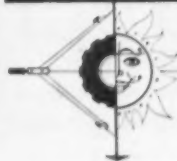
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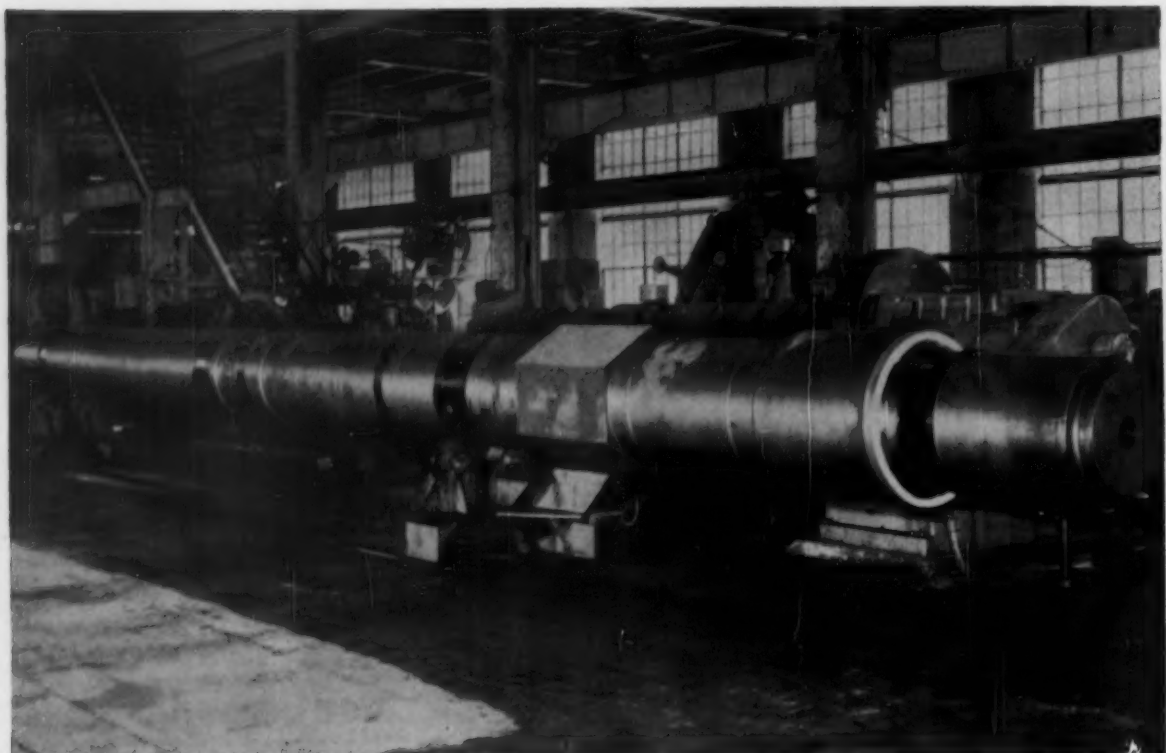
Gordon Varney, President  
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This plastic scale model manufacturer points up what

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## Forged-steel shaft weighs 42 tons; will be used in mine hoist

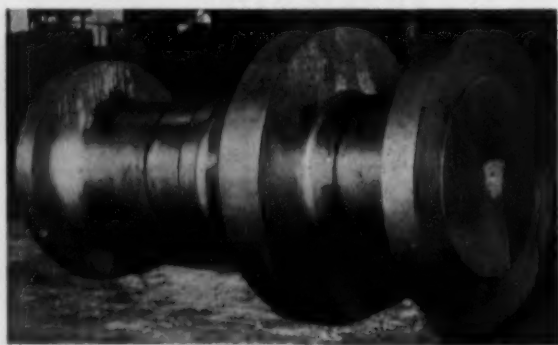
**A**bove is an interesting carbon-steel forging that is destined to become the shaft for a large mine hoist. As you can imagine, a tremendous amount of work had gone into it before the photograph was taken. The piece was forged, heat-treated, rough-machined, and smooth-bored in the Bethlehem shops, and as you see it here, it weighs in excess of 42 tons. It is 43 ft, 8 in. long.

Forgings like this require special facilities, and Bethlehem has them. We can readily turn out pieces that run a hundred tons or more. On the other hand, we are equally well prepared to produce much lighter items, such as the forging shown in the smaller picture. That one, a thrust shaft, doesn't weigh a full nine tons.

Shafts, of course, are but one of the many types of forgings that Bethlehem makes each year. Through our shops pass everything from giant steel columns to little drop forgings that you can hold in one hand. Whenever you need a forged product of any size, type, or weight, Bethlehem is fully

prepared to make it for you and offer a good delivery date.

And please remember, too, that we are always set up to rough- or finish-machine — to your exact specifications.

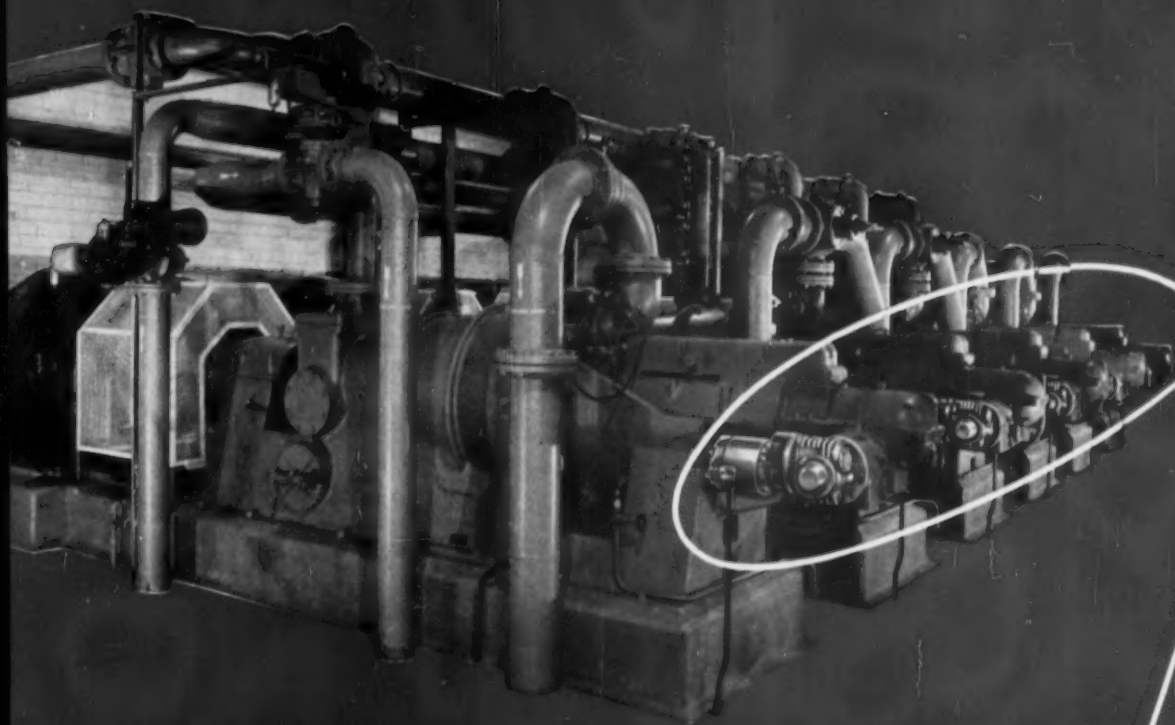


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# ELMES Double-Action DRAWING & FORMING PRESS

## "Custom Built" for deep drawing of large high-pressure gas containers

The press shown at right is a typical example of the work of Elmes engineers in designing hydraulic equipment to meet special requirements. This press is located in the plant of one of the nation's largest producers of high-pressure gas containers. A variety of container sizes, made of special high strength alloy steel, are drawn to exacting dimensional specifications. The press must maintain uniformly accurate concentric diameters and wall thickness in the part.

Many important Elmes construction and control features are responsible for maintaining the high quality and efficiency of production on this type of heavy-piece, deep-draw work. Following are just a few of these features:

- Ring key positioning, assuring constantly maintained "all-directional" alignment of press crown, bed, and housings.
- Extra-long guide ways for main and blankholder slide, counteracting all tendency of the slide to deflect during pressing operation.
- Provision for extra-fine gib adjustment and slide alignment obtained by use of non-metallic facing on the gibs and hand-scraped bearing surfaces.
- Press equipped with a separate pumping unit for powering the blankholder system. Assures maintenance of the blankholder pressure irrespective of main slide movement.
- Individual corner pressure adjustment provided for blankholder slide.

Elmes craftsmanship in press design and construction will assure you of press performance at its best. Recommendations and cost estimates will be promptly supplied, and entirely without obligation, of course. See your authorized Elmes Distributor, or write to us direct.



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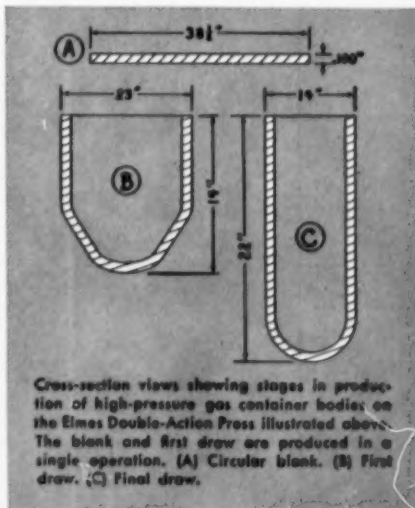
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Action,  
Moving-Down  
Type

Elmes Double-Action Drawing & Forming Press, equipped with die cushion. Main platen capacity 300 tons, blankholder capacity 100 tons. For single-action operations of main platen and blankholder, capacities are combined for a total of 400 tons.



Cross-section views showing stages in production of high-pressure gas container bodies on the Elmes Double-Action Press illustrated above. The blank and first draw are produced in a single operation. (A) Circular blank. (B) First draw. (C) Final draw.